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Manual of
The Odonata of New England

by R. Heber Howe, Jr.

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Memoir of
the Thoreau Museum of Natural History: II

Middlesex School
Concord, Massachusetts

MEMOIR
OF THE
THOREAU MUSEUM OF NATURAL HISTORY: II
Manual of the Odonata of New England

By R. HEBER HOWE, Jr.

PART I.

March, 1917.

In 1905 Dr. P. P. Calvert published * a list of the Odonata of New England. Since that date a considerable number of species have been added to his list, bringing the number known from this area to over one-hundred and fifty. Our distributional knowledge of species in the six states of this group has also been very much enlarged.

The present work is an attempt to supply a field manual of the New England Odonata for the use of all classes of students. A pictorial key of genera, and illustrations of the diagnostic characters of species are given, in the hope that an easy recognition of these insects will lead to a more general study of them. The habitat, abundance, limital dates of capture, and all known stations are recorded, and for the most part the ranges mapped.

The classification as given by Dr. Muttkowski in his Catalogue of the Odonata of North America (1910) has been adopted. The author wishes to express his sincere thanks to Mr. E. B. Williamson, Dr. R. A. Muttkowski, Mr. L. B. Woodruff, Dr. E. M. Walker, Mr. C. W. Johnson, Dr. Samuel Henshaw, Mr. Nathan Banks, Dr. R. P. Currie, Dr. F. E. Lutz, Dr. P. P. Calvert, Messrs. D. M. and B. K. Little, Mr. W. T. Davis, Mr. D. L. Dutton, Mr. A. P. Morse, and to my daughter, Miss S. A. Howe, for valued help.

Order: Odonata Fabricius

* No. 6. Occasional Papers of the Boston Soc. Nat. Hist. 7: Fauna of N. E., Oct. 1905.

Pictorial Key of Genera

ODONATA

Zygoptera: Damsel Flies



Wings closed when alighted.

Anisoptera: Dragon Flies



Wings open when alighted.



Eyes widely separated, by more than the full width of an eye.



Eyes approximate, separated by less than half the width of an eye. (See *Aeshnidae* and *Libellulidae*).

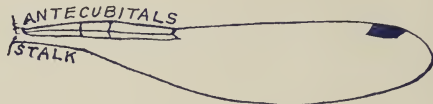


Agrionidae

Coenagrionidae



Five or more antecubitals. Wings not stalked.



Two (rarely three) antecubitals. Wings stalked (see page 6).

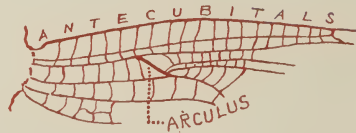
Agrioninae

Agrion

Haeterina



Arculus bent.



Arculus straight.

Suborder: Zygoptera Selys

Family: Agrionidae Leach

Subfamily: Agrioninae Kirby

Genus: Agrion Fabricius

Agrion amatum
dimitiatum apicale
aequabile
maculatum

Me. N. H. Vt. Mass. R. I. Conn.

	+		+		+
			+		
+	+	+	+		+
+	+	+	+	+	+

a. Wings *narrow* (7-9 mm.),
front and hind margins nearly *parallel*.

Pterostigma in all females occasionally absent or poorly developed.

1. **Agrion amatum** (Hagen).

Psyche 5: 244. 1889. Type locality: "Dublin, New Hampshire."

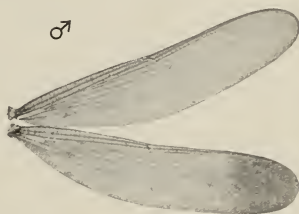
Rare,—cold, wooded, mountain brooks, alt. 500 to 1300 ft.

June 18 to July 14.

New Hampshire: Franconia (Slosson); Dublin (Hagen); Peterboro (Cabot); Intervale (U. S. N. M.).

Massachusetts: Montgomery (M. C. Z. & U. S. N. M.).

Connecticut: Litchfield (Woodruff).*



2. **Agrion dimidiatum apicale**
(Burm.).

Handb. ent. 2: 827. 1839. Type locality: "Vaterland unbekannt." (Apparently Philadelphia).

Very rare,—brooks and ditches. This species is often confused with the following, and all records need careful verification.



A. amatum (natural size).
Wings fuliginous, hind wings ♂ brown at tip.

June 21 to July 21.

Massachusetts: Waltham, South Reading (Hagen); Carver (B. S. N. H.); Medfield (Morse).

b. Wings *wide* (9-10 mm.), hind margin *bowed*.

3. **Agrion aequabile** (Say).

Journ. acad. nat. sci. Phila. 8: 33. 1839. Type locality: "Massachusetts."

Common,—brooks, creeks, and ditches.

May to July 21.



A. d. apicale (natural size). Wings hyaline or fuliginous; ♂ brackish at tips.

* Jour. N. Y. Ent. Soc. 22: 155. 1914.

Maine: Foxcroft, South Lagrange, Orono, Bradley, Auburn (Harvey); Manchester (Wadsworth); Bethel, Norway (Hagen); Machias (B. S. N. H.).

New Hampshire: Peterboro (M. C. Z.); Piscataqua river (M. C. Z.).

Vermont: Newport (Slosson).

Massachusetts: Worcester (Hitchings); Sherborn (Babcock); Lawrence, Brookline, Tyngsboro (Hagen); North Reading, Great Barrington, North Adams, (B. S. N. H.); Concord (Howe); South Natick (Morse); Norfolk Co., (M. C. Z.).

Connecticut: Litchfield (Woodruff).

4. *Agrion maculatum* Beauv.

Ins. Afr. Amer. 85. pl. 7. f. 3. 1805.

Type Locality: "Etat-Unis d'Amerique."

Abundant, — woodland and grass grown brooks, and streams.

April 16 to August 27.

Maine: No. East Carry, Foxcroft, South Lagrange, Orono, Bradley, Farmington (Harvey); Manchester (Wadsworth); Norway (Hagen); Mt. Desert (Bullock); Wales, Machias (B. S. N. H.); Norcross (U. S. N. M.).

New Hampshire: Meredith Neck (Howe); Franconia (U. S. N. M.).

Vermont: Newport (Slosson); Bennington (B. S. N. H.); Brandon (Dutton).

Massachusetts: Ipswich, Cambridge, Milton, Sutton, Northampton (Hagen); Sherborn (Babcock); Nahant, Dorchester, Andover, Tyngsboro, Brookline (M. C. Z.); Hopkinton, Blue Hills, Auburndale (B. S. N. H.); North Saugus (U. S. N. M.); Concord (Howe).

Rhode Island: Apponaug (B. S. N. H.).

Connecticut: Litchfield (Woodruff); Darien, Rowayton (B. S. N. H.); Devil's Garden (U. S. N. M.).



♂



♀

A. aequabile (natural size).
Wings fuliginous; blackish ♂ or brown ♀ at tips.

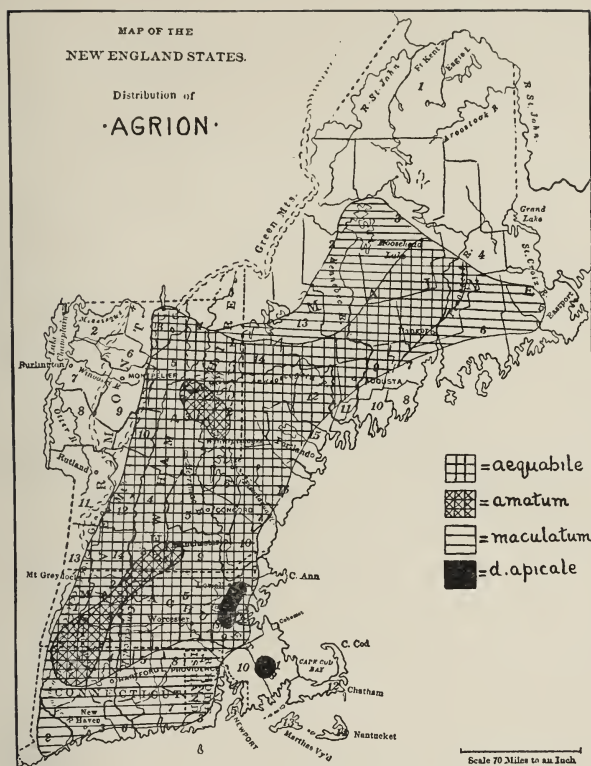


♂



♀

A. maculatum (natural size).
Wings black ♂, and brown ♀



Genus: Haeterina Hagen

Me. N. H. Vt. Mass. R. I. Conn.

Haeterina americana

+

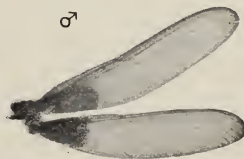
+

5. *Haeterina americana* (Fabr.).

♂

Ent. syst. suppl. 287. 1798. Type
locality: "America."

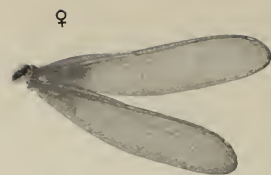
Uncommon, — meadow brooks,
ditches, and rivers.



June 22 to September 16.

Maine: Chemo Mills, Bradley, Winslow,
Auburn (Harvey); Norway (Hagen).

Massachusetts: Salem, Weston (Hagen);
Wellesley (B. S. N. H.); Sherborn (Morse);
Cambridge, Provincetown (M. C. Z.).



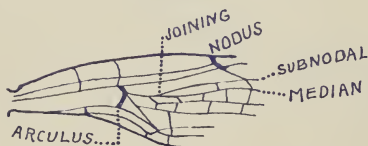
H. americana (natural size).
Wings yellowish; red ♂ or
orange ♀ at base.



NOTE: B. S. N. H. = Boston Society of Natural History, Boston, Mass.; U. S. N. M. = U. S. National Museum, Washington, D. C.; M. C. Z. = Museum Comparative Zoölogy, Cambridge, Mass.

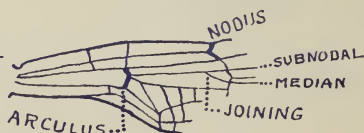
Coenagrionidae

Lestinae



Subnodal and median veins joining
nearer the arculus than the nodus.

Coenagrioninae



Subnodal and median veins joining
nearer the nodus than the arculus.
(See **Coenagrioninae**.)

Family: Coenagrionidae Kirby

Subfamily: Lestinae Needham

Genus: Lestes Leach

Me. N.H. Vt. Mass. R.I. Conn.

Lester eurus				+		+
congener	+	+		+		+
unguiculatus	+		+	+	+	
uncatus	+	+	+	+		+
disjunctus	+	+		+		+
forcipatus	+			+		+
rectangularis	+	+		+	+	+
vigilax	+	+		+	+	+
inequalis	+	+		+		

A. Wings ♂ distinctly *fuliginous*. ♂ wings 25-29 mm. long. ♀ wings 27-28 mm. long.

NOTE: The females of all agrionines are difficult to determine as they have few marked characters, and are often dimorphic. Pairs taken in copulation will supply material for study.

The drawings of the male abdominal appendages are from Dr. Calvert's Catalogue of the Odonata of Philadelphia (Trans. Amer. Ent. Soc. 20: 152-272, 1893), and are republished with permission.

6. *Lestes eurus* Say.

Jour. acad. nat. sci. Phila. 8:36. 1839. Type locality: "Massachusetts."

Uncommon,—ponds.

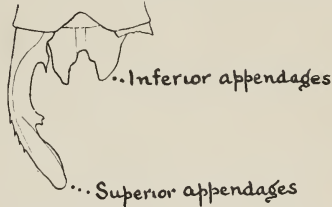
July 10 to 20.

Massachusetts: Sherborn (Babcock); Milton (Hagen); Woods Hole (Kellicott); Brookline, Provincetown (M. C. Z.); Wellesley, Green Lodge (Morse); Concord (Howe).

Connecticut: Burchard's Pond, Fairfield Co. (U. S. N. M.).

B. Wings ♂ and ♀ *hyaline*. ♂ wings less than 25 mm., ♀ wings less than 24 mm. long.

a. ♂ inferior appendages *less than half* as long as superior appendages. ♀'s with a *yellow mid-dorsal line* along the abdomen.



7. *Lestes congener* Hagen.

Syn. Neur. N. Amer. 67. 1861. Type locality: "New York."

Uncommon,—ponds and ditches.

July 29 to October 9.

Maine: North West Carry, Orono (Harvey); Manchester (Wadsworth).



New Hampshire: Franconia (U. S. N. M.).

Massachusetts: Concord (Howe); West Chop (Morse).

Connecticut: Litchfield (Woodruff).

b. ♂ inferior appendages *over half* as long, but *not* longer than the superior appendages. ♀'s with a *yellow line* across the back of the head.

8. *Lestes unguiculatus* Hagen.

Syn. Neur. N. Amer. 70. 1861. Type locality: "Chicago; Bergen Hill, New Jersey; New York; St. Louis; Wisconsin."

Common,—ponds and ditches.

June 17 to September 5.

Maine: North West Carry, Orono (Harvey); Manchester (Wadsworth); York Harbor (Moore).

Vermont: Brandon (Dutton).

Massachusetts: Worcester (Hitching); Cuttyhunk island (Calvert); Martha's Vineyard (Moore); Concord (Howe); Provincetown, Melrose Highlands (U. S. N. M.).

Rhode Island: Providence (Davis); Block Island (Woodruff).

1. ♂ inferior appendages *straight*, or nearly so. ♂ wings less than 22 mm. long. ♀ with *no yellow line* on back of head.

Wings less than 24 mm. long.



9. *Lestes uncatus* Kirby.

Cat. Odon. 160, 1890. Type locality: "Chicago; Washington; Wisconsin."

Uncommon,—ponds and ditches.

June 16 to September.

Maine: Orono (Harvey); Manchester (Wadsworth).

New Hampshire: Franconia (Slosson); North Conway (Calvert); Squam lake (B. S. N. H.).

Vermont: Brandon (Dutton).

Massachusetts: Cambridge, Milton (Hagen); Worcester (Hitchings); Concord (Howe); Mt. Everett, Chester (B. S. N. H.).

Connecticut: Darien (B. S. N. H.).



♀ Side thoracic markings: light line (humeral) between dark bands *uniformly narrow*.

(To be continued.)

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PART II.

August, 1917.

10. **Lestes disjunctus** Selys.

Bull. acad. Belg. 16: 210. 1862. Type locality: "Nouvelle-Ecosse, Maine, Illinois, Chicago."

Uncommon,—ponds, ditches, and brooks.

June to September 18.

Maine: Orono, Fryeburg (Harvey); Manchester (Wadsworth); Norway (M. C. Z.).

New Hampshire: Fabyan's (Calvert); Franks (Slosson); Moultonboro, Meredith Neck (Howe).

Massachusetts: Concord, Nantucket (Howe); Norfolk Co. (M. C. Z.); Provincetown (B. S. N. H.).

Connecticut: Litchfield (Woodruff); North Windham, South Kent (Morse).



♀ light line *narrow*, but
widening *slightly*
anteriorly.

11. **Lestes forcipatus** Rambur.

Ins. Neur. 246. 1842. Type locality: "l'Amérique septentrionale."

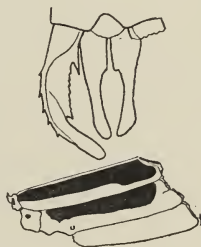
Not uncommon,—ponds and ditches.

June 27 to September 5.

Maine: Orono, Fryeburg (Harvey); Manchester (Wadsworth).

Massachusetts: Sherborn (Babcock); Worcester (Hitchings); Cuttyhunk Island (Calvert); Woods Hole (U. S. N. M.); Concord, Monument Beach, (Howe).

Connecticut: New Haven (Moore); Litchfield (Woodruff).



♀ light line *uniformly*
wide $\frac{2}{3}$ its length.

12. **Lestes rectangularis** Say.

Journ. acad. nat. sci. Phila. 8: 34. 1839. Type locality: "Indiana, Massachusetts."

Common,— ponds, brooks, and ditches.

June 21 to September 19.

Maine: Orono, Fryeburg (Harvey); Manchester (Wadsworth).

New Hampshire: Franconia (Slosson); Moultonboro, Meredith Neck (Howe).

Massachusetts: Milton (Hagen); Worcester (Hitchings); Cuttyhunk Island (Calvert); Sherborn (B. S. N. H.); Medfield, Dover (Morse); Winchendon, Cambridge, Saugus, Brookline, Norfolk Co. (M. C. Z.); Woods Hole, Provincetown (U. S. N. M.); Concord, Monument Beach (Howe); Hingham (Barnes).

Rhode Island: Providence (Davis); Block Island (Calvert); Bristol (Howe).

Connecticut: Litchfield (Woodruff); Bethlehem (U. S. N. M.).

2. ♂ wings *more* than 22 mm. long. ♀ wings *more* than 24 mm. long.

13. *Lestes vigilax* Hagen.

Bull. acad. Belg. 16: 214. 1862. Type locality: "New-Jersey."

Common,— lakes, ponds, and ditches.

June 19 to September 5.

Maine: Manchester (Wadsworth); Fryeburg (Harvey); Cape Elizabeth (M. C. Z.); Orono (U. S. N. M.).

New Hampshire: Moultonboro, Meredith Neck (Howe).

Massachusetts: Worcester (Hitchings); Nantucket (Albertson); Concord, Wareham (Howe); Medfield, Sherborn, (Morse); Natick, Cambridge (M. C. Z.).

Rhode Island: Block Island, Meredith Neck (Calvert).

Connecticut: Litchfield (Woodruff); South Kent (Morse); Darien (U. S. N. M.).

c. ♂ inferior appendages *longer* than superior. ♀ back of head *entirely yellow*.



♀ light line widening anteriorly.



14. *Lestes inequalis* Walsh.

Proc. acad. nat. sci. Phila. 385. 1862. Type locality: [Rock Island, Illinois.]

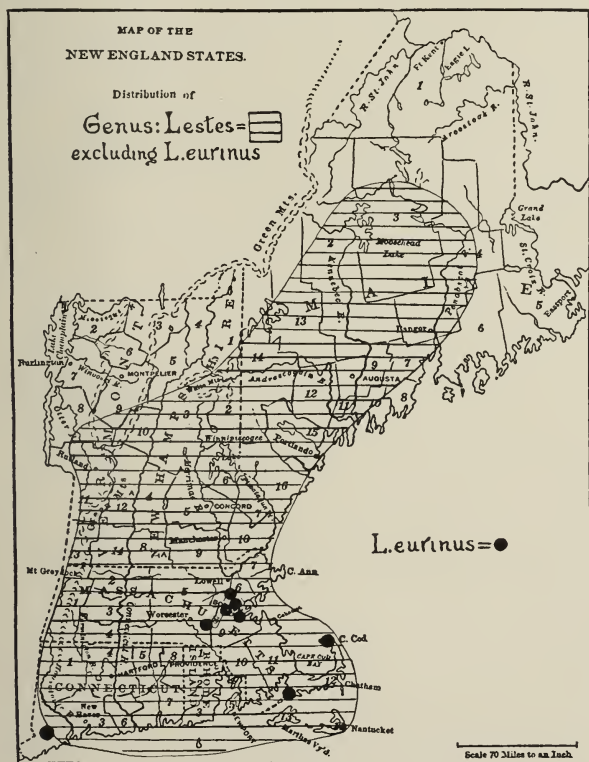
Rare,— lakes, ponds, and ditches.

June 17 to August 15.

Maine: Bradley, Orono (Harvey); Manchester (Wadsworth).

New Hampshire: Franconia (Slosson); Moultonboro, Meredith Neck (Howe).

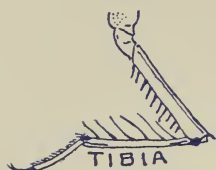
Massachusetts: Cohasset, Blue Hills, North Reading, Manomet (B. S. N. H.); Hyde Park (M. C. Z.); Sherborn (Morse).



NOTE: Since the publication of Part I, I have secured a record of *L. unguiculatus* for New Hampshire: White Mts., (M. C. Z.). I have also found the species common at Nantucket, Hingham (Barnes), Cohasset (Warden), and Woods Hole, Mass., and Middletown, R. I.

Coenagrioninae

Argia



Hairs on tibia *twice* as long as the spaces between the hairs.

Group 1



Hairs on tibia *never* twice as long as the spaces between the hairs (see Group 1).

Subfamily: Coenagrioninae Kirby

Genus: Argia Rambur

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Argia moesta	+	+		+		+
Argia violacea	+	+	+	+	+	+
Argia sedula				+	?	

A. *More than one cell* under pterostigma.



15. Argia moesta (Hagen).*

Syn. Neur. N. Amer. 94. 1861. Type locality: "Pecos River, Western Texas."

* = A. moesta var. putrida (Hagen) see Ent. News 23: 196-203, 1912.

Common,—ponds and lakes.

June 25 to August 30.

Maine: Orono (Harvey); Manchester (Wadsworth);
Liberty, Pudding pond (B. S. N. H.); Bradley (U. S. N. M.).

New Hampshire: Moultonboro, Meredith Neck, (Howe).

Massachusetts: Worcester (Hitchings); Natick, Sherborn (Morse);
Concord (Howe).

Connecticut: Litchfield (Woodruff); Darien (U. S. N. M.).

B. Only *one cell* under pterostigma of wing.



16. Argia violacea (Hagen).

Syn. Neur. N. Amer. 90. 1861. Type locality: "Maryland," etc.

Abundant,—ponds, and lakes.

June 6 to September 10.

Maine: Bradley, Orono (Harvey); Manchester (Wadsworth);
Mt. Desert (Bullock).

New Hampshire: Meredith Neck (Howe).

Vermont: Brandon (Dutton).

Massachusetts: Wareham, Concord (Howe); Medfield, Dover (Morse); Gloucester (U. S. N. M.); Hingham (Barnes).

Rhode Island: Providence (Davis).

Connecticut: West Hartford, Milton, Litchfield (Woodruff).

NOTE: *Argia apicalis* (Say). Though included in Dr. Calvert's list, the record was expunged by Mr. E. B. Williamson (Ent. News 17: 31. 1906).

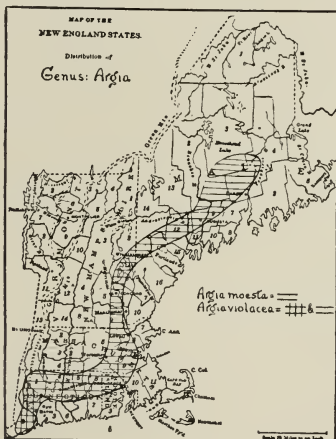
Argia sedula (Hagen). Two teneral specimens were taken in Concord, Mass., on June 14, 1916, which were doubtfully referred here by Mr. E. B. Williamson.

The figures of the male abdominal appendages are reproduced with permission from Hagen's paper (Bull. Mus. Comp. Zool. 34: 1902).



♂ Abdominal appendages (side view).

♀ Side view of thorax.



NOTE: A specimen of *A. violacea* taken since this map was made extends the range to Buzzards Bay.

Group 1

Group 2



Pale spots (rarely connected by pale narrow line) on top of head.

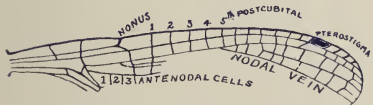
Enallagma

Group 3

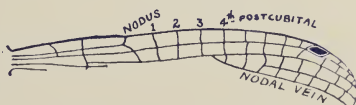


No pale spots on top of head. (see Group 4—*Chromagrion*, *Nehalennia*, and *Amphiagrion*.)

Group 5



Nodal vein of fore-wing arising near or beyond 5th postcubital.



Nodal vein of fore-wing arising not beyond 4th postcubital. (see Group 5—*Ischnura* and *Anomalagrion*.)

NOTE: The females of this, and the following genera have so few satisfactory characters for determination that specimens taken in copulation will supply the only reliable material for study and comparison. The drawings of the male abdominal segments are in many incidences based with permission on Needham's plate 19 (Bull. 68, N. Y. State Mus. 1903), those of *Nehalennia* and of *Ischnura kellicotti* on Williamson (Ent. News 24: 313. 1913, and 9: Pl. 9. 1898).

Genus: Enallagma Charpentier.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Enallagma durum</i>				+	+	
<i>cyathigerum</i>	+	+		+		+
<i>hageni</i>	+	+	+	+		
<i>calverti</i>	+	+		+		
<i>divagans</i>				+		+
<i>ebrium</i>	+	+	+	+		+
<i>traviatum</i>		+	?	+		
<i>aspersum</i>		+		+		+
<i>minusculeum</i>		+		+		
<i>doubledayi</i>				+		
<i>carunculatum</i>						+
<i>civile</i>	+	+		+	+	+
<i>laterale</i>				+		
<i>exsulans</i>	+	+		+		+
<i>signatum</i>	+	+		+	+	+
<i>pollutum</i>	+	+		+		
<i>pictum</i>				+		
<i>geminatum</i>	+			+		+

A. 4 or 5 antenodal cells.

17. *Enallagma durum* (Hagen).

Syn. Neur. N. Amer. 87. 1861. Type locality: "Maryland; Louisiana; Florida."

Rare,—rivers and brooks.

July to August 25.

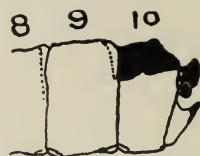
Massachusetts: Woods Hole, Cuttyhunk Island (Calvert, Ufford).

Rhode Island: Watch Hill (Calvert).

B. 3 antenodal cells.

a. ♂ with abdominal segments 8 and 9 *unmarked* with black.

♀ with black marking on dorsal surface of last abdominal segment.



♂ side view last abdominal segments.

18. *Enallagma cyathigerum* (Charp.).

Lib. Eur. 163. 1840. Type locality: "Silesia."

Uncommon,— ponds and lakes.



June to July. 13.

Maine: Manchester (Wadsworth).

New Hampshire: Hermit Lake (Selys);
Franconia (Slosson).

Massachusetts: (Selys); Nantucket (Howe).

19. **Enallagma hageni** (Walsh).

Proc. ent. soc. Phila. 2: 234. 1863. Type locality: [Rock Island, Illinois.]



Common,— lakes and ponds.

June to August.

Maine: Foxcroft, Rangeley, Orono, Fryeburg (Harvey); Mt. Desert (Bullock); Manchester (Wadsworth); York Harbor (Moore).

New Hampshire: Meredith, Moultonboro (Howe).

Vermont: Brandon (Dutton).

Massachusetts: Worcester (Hitchings); Dedham (Selys).

20. **Enallagma calverti** Morse.

Psyche 7: 208. 1895. Type locality: "Franktown, Nev."

Rare,— ponds and marshes.



June 15 to August 12.

Maine: Orono (Harvey).

New Hampshire: Profile Lake (Howe).

Massachusetts: Wellesley (Morse); Sherborn (Babcock); Concord (Howe).

21. **Enallagma ebrium** Hagen.

Syn. Neur. N. Amer. 89. 1861. Type locality: "Chicago, North America; New Orleans."

Common,— ponds and brooks.



June 21 to August 30.

Maine: Manchester (Wadsworth).

New Hampshire: Fabyan's (Calvert); Meredith Neck, Moultonboro (Howe).

Vermont: Brattleboro (Morse); Brandon (Dutton).

Massachusetts: West Bridgewater (Tower); Concord (Howe); Winchendon, Mt. Everett (B. S. N. H.).

Connecticut: Litchfield (Woodruff).

22. **Enallagma traviatum** Selys.

Bull. acad. Belg. 41: 517. 1876. Type locality: "Dedham, (Massachusetts)."

Rare,— ponds and lakes.

July 18 to August 19.

New Hampshire: ? ♀ Moultonboro (Howe).

Massachusetts: Dedham (Selys); Sherborn (Morse); Concord (Howe); Hingham (Barnes).



23. **Enallagma aspersum** (Hagen).

Syn. Neur. N. Amer. 97. 1861. Type locality: "New York; Bergen Hill, New Jersey; Chicago."

Uncommon,— ponds.

July to September 5.

Maine: Norway (M. C. Z.).

New Hampshire: North Conway (Calvert).

Massachusetts: Nonamesset Island, Woods Hole (Calvert); Concord, Nantucket (Howe).

Connecticut: Fairfield Co. (U. S. N. M.).



24. **Enallagma minusculum** Morse.

Psyche 7: 207. 1895. Type locality: "Sherborn, Mass."

Rare,— lakes and ponds.

July to August 23.

New Hampshire: Meredith Neck (Howe).

Massachusetts: Sherborn (Morse).



25. **Enallagma doubledayi** Selys.

Rev. odon. Eur. 209. 1850. Type locality: "St. John Bluff, en Floride."

Rare, — ponds.

August.

Massachusetts: Provincetown (Williamson); Nonamesset Island (Calvert).



26. **Enallagma carunculatum** Morse.

Psyche 7: 208. 1895. Type locality: "Franktown, Nev."

Connecticut: Litchfield (Woodruff).



27. **Enallagma civile** (Hagen).

Syn. Neur. N. Amer. 88. 1861. Type locality: "New York," etc.

Abundant,— lakes, ponds.

May to September 5.

Maine: Orono (Harvey); Manchester (Wadsworth); York Harbor (Moore).

New Hampshire: Lake Asquam, Meredith Neck, Moultonboro (Howe).

Massachusetts: Sherborn (Babcock); Worcester (Hitchings); Woods Hole, Cuttyhunk Island (Calvert); Martha's Vineyard (Moore); Concord, Nantucket, Wareham, Monument Beach (Howe).

Rhode Island: Providence (Davis) Watch Hill, Block Island (Calvert); Bristol, Middletown (Howe).

Connecticut: Litchfield (Woodruff).

aa. ♀ with *last* abdominal segment *unmarked* with black.



28. **Enallagma divagans** Selys.

Bull. acad. Belg. 41: 521. 1876. Type locality:—"Derdam, [= Dedham] Massachusetts."

Rare, — ponds.

Massachusetts: Dedham.

Connecticut: Litchfield (Woodruff).

b. ♂ with all *three* last abdominal segments *marked* with black.

♀ with *last* abdominal segment *unmarked* with black.



29. **Enallagma pictum** Morse.

Psyche 7: 274. 1895. Type locality: "Sherborn, Mass."

Very rare,— ponds and ditches.

Massachusetts: Sherborn (Babcock).

bb. ♀ with *ninth* abdominal segment *entirely* black.



30. **Enallagma geminatum** Kellicott.

Ent. news 6: 239. 1895. Type locality: "Licking Reservoir, Ohio [etc.]... Corunna, Mich."

Uncommon,— brooks, ponds and lakes.

June to September 10.

Maine: Bradley (Harvey).

Massachusetts: Concord (Howe).



Connecticut: Mt. Carmel, New Haven (Moore); Litchfield (Woodruff).

c. ♂ with abdominal segment 9 *unmarked* with black.

♀ with *last* abdominal segment *marked* with black.

31. **Enallagma laterale** Morse.

Psyche 7: 274. 1895. Type locality: "Wellesley, Mass."

Rare,— ponds.

May 25 to July.

Massachusetts: Wellesley (Morse); Concord (Howe).

cc. ♀ with *last* abdominal segment *unmarked* with black.

32. **Enallagma exsulans** (Hagen).

Syn. Neur. N. Amer. 82. 1861. Type locality: "Philadelphia; Berkeley Springs, Virginia; Pecos River, Western Texas."

Common,— brooks, ponds and lakes.

June to August 7.

Maine: Orono (Harvey); Manchester (Wadsworth).

New Hampshire: Meredith Neck (Howe).

Massachusetts: Sherborn, Medfield (Morse).

Connecticut: Litchfield, West Hartford (Woodruff).

33. **Enallagma signatum** (Hagen).

Syn. Neur. N. Amer. 84. 1861. Type locality: "Georgia; Louisiana."

Common,— ponds, semicrepuscular.

July 2 to September 2.

Maine: Bradley (Harvey); Manchester (Wadsworth).

New Hampshire: Meredith Neck, Moultonboro (Howe).

Massachusetts: Worcester (Hitchings); Concord, Woods Hole (Howe).

Rhode Island; Block Island (Woodruff); Middletown (Howe).

Connecticut: West Hartford (Woodruff).

34. **Enallagma pollutum** (Hagen).

Syn. Neur. N. Amer. 83. 1861. Type locality: "Florida."

Uncommon,— ponds, semi-crepuscular.

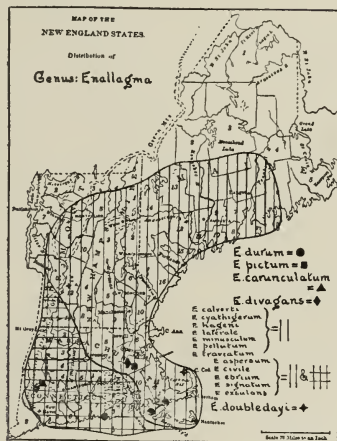


June 23 to August 25.

Maine: Bradley (Harvey); Manchester (Wadsworth).

New Hampshire: Moultonboro (Howe).

Massachusetts: Concord (Howe).



Group 4



3

Nehalennia

♂ and ♀ bronze green above, abdomen slender.



3

Amphigrion

♂ and ♀ red and black above, abdomen stout.



Chromagrion

♂ and ♀ blue and black above.

Color pattern of thorax and base of abdomen of ♂'s as seen from above, (also 3rd segment drawn to scale).

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Nehalennia irene	+	+	+	+		+
gracilis				+		

35. *Nehalennia irene* (Hagen).

Syn. Neur. N. Amer. 74. 1861. Type locality: "Chicago . . . Maine."

Uncommon,—grassy ponds and bogs.

June 24 to August 5.

Maine: Orono, Fryeburg, Westbrook (Harvey); Manchester (Wadsworth); York Harbor (Moore).

New Hampshire: Meredith, Moultonboro (Howe).

Vermont: Brandon (Dutton).

Massachusetts: Worcester (Hitchings);

Concord, Nantucket (Howe); Mt. Everett, Chester (B. S. N. H.).

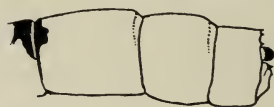
Connecticut: Litchfield (Woodruff).



36. **Nehalennia gracilis** Morse.

Psyche 7: 274. 1895. Type locality: "Sherborn [and] Wellesley, Mass."

Very rare,—grassy ponds, bogs.



June 19 to July 19.

Massachusetts: Wellesley, Sherborn (Morse).

Genus: Amphiagrion Selys

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Amphiagrion	+	+	+	+		

37. **Amphiagrion saucium** (Burm.).

Handb. ent. 2: 819. 1839. Type locality; "Süd-Karolina."

Rare,—ponds and wet meadows.



June to July.

Maine: Orono, Bradley (Harvey); Manchester (Wadsworth).

New Hampshire: Franconia (Slosson).

Vermont: Leicester (Dutton); Montgomery (B. S. N. H.).

Massachusetts: (Hagen).

Genus: Chromagrion Needham.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Chromagrion conditum	+	+		+		+

38. **Chromagrion conditum** (Hagen).

Bull. acad. Belg., 41: 1305. 1876.

Type locality: "Maryland.... Washington."

Uncommon,—ponds and brooks.



May to July 7.

Maine: Orono, Bradley (Harvey); Manchester (Wadsworth).
 New Hampshire: Franconia (Slosson).
 Massachusetts: Sherborn (Babcock); Concord (Howe).
 Connecticut: Litchfield (Woodruff).

Group 5

Ischnura



Pterostigma of male touching the costa on fore wings.

♀'s with more than 7 postcubitals.

Anomalagrion



Pterostigma of male not touching the costa of fore wings.

♀'s with less than 7 postcubitals.

Genus: Ischnura Charp.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Ischnura verticalis</i>	+	+	+	+	+	+
kellicotti	+				+	
ramburi	+			+	+	
posita	+	+		+	+	+

39. *Ischnura verticalis* (Say).

Journ. acad. nat. sci. Phila. 8:37.
 1839. Type locality: "Indiana."

Abundant,—grassy ponds, brooks and ditches.



♀ dichromatic during growth.

May to September 26.

Maine: Orono, Fryeburg (Harvey); Mt. Desert (Bullock); Manchester (Wadsworth); York Harbor (Moore).

New Hampshire: Fabyan's (Calvert); Meredith Neck, Centre Harbor, Moultonboro (Howe).

Vermont: Newport (Slosson); Brandon (Dutton).

Massachusetts: Worcester (Hitchings); Woods Hole, Cuttyhunk Island (Calvert); Martha's Vineyard (Moore); Concord, Nantucket Monument Beach (Howe); Bradley, Provincetown (B. S. N. H.);

Rhode Island: Providence (Davis); Block Island (Calvert); Middletown (Howe).

Connecticut: Poquonock (Britton); South Manchester (Sturgis); Mt. Carmel (Moore); Litchfield (Woodruff); Middletown (B. S. N. H.).

40. **Ischnura kellicotti** Williamson.

Ent. News 9: 209. 1898. Type locality: "Round and Shriner Lakes, Whitley County, Indiana."

Rare,— lakes and ponds.

July to August.

Maine: Manchester (Wadsworth).

Rhode Island: Block Island (Calvert).



41. **Ischnura ramburii** Selys.

Rev. odon. Eur. 186. 1850. Type locality: "Yucatan."

Rare,— ponds, ditches, and salt marsh borders

August to October 2.

?Massachusetts: Canton (M. C. Z.).

Rhode Island: Watch Hill (Calvert); Bristol, Middletown (Howe).



42. **Ischnura posita** (Hagen).

Syn. Neur. N. Amer. 77. 1861. Type locality: "Savannah, Dalton, Georgia; Washington."

Uncommon,— grassy ponds.

June to September 3.

Maine: Orono, Penobscot River (Harvey).

New Hampshire: White Mts. (M. C. Z.).

Massachusetts: Salem (Selys); Nantucket, Concord (Howe).

Rhode Island: Providence (Davis); Block Island (Calvert); Middletown (Howe).

Connecticut: Litchfield (Woodruff).



Genus: Anomalagrion Selys.

	Me. N. H.	Vt. Mass.	R. I. Conn.
Anomalagrion hastatum	+		+

43. **Anomalagrion hastatum** (Say).

Journ. acad. nat. sci. Phila. 8: 38. 1839. Type locality: "Indiana."

Very rare,—marshes and swamps.

Maine: (Hagen).

Massachusetts: (Hagen).



ODONATA

Zygoptera: Damsel Flies

Anisoptera: Dragon Flies



Wings closed when alighted.



Wings open when alighted.



Eyes widely separated, by more than the full width of an eye.



Eyes approximate, separated by less than half the width of an eye.

(See later key to Anisoptera: Dragon Flies.)

Agrionidae

Coenagrionidae



Five or more antecubitals. Wings not stalked.

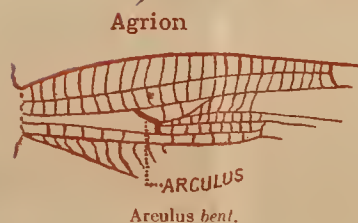


Two (rarely three) antecubitals. Wings stalked.

Agrioninae

Lestinae
Lestes

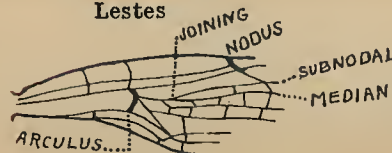
Coenagrioninae



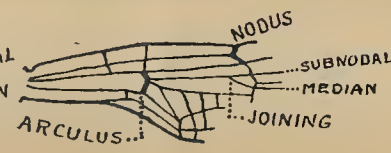
Arculus bent.



Arculus straight.



Subnodal and median veins joining nearer the arculus than the nodus.



Subnodal and median veins joining nearer the nodus than the arculus.

Argia



Hairs on tibia twice as long as the spaces between the hairs.



Hairs on tibia never twice as long as the spaces between the hairs.

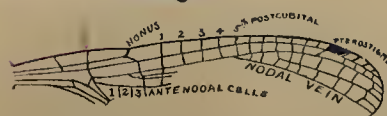


Pale spots (rarely connected by pale narrow line) on top of head.

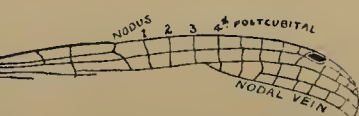


No pale spots on top of head.

Enallagma



Nodal vein of fore-wing arising near or beyond 5th postcubital.



Nodal vein of fore-wing arising not beyond 4th postcubital.

Ischnura

Anomalagrion



Pterostigma of male touching the costa on fore wings.
♀'s with more than 7 postcubitals.



Pterostigma of male not touching the costa of fore wings.
♀'s with less than 7 postcubitals.

Nehalennia

Amphiagrion

Chromagrion



♂ and ♀ bronze green above, abdomen slender.



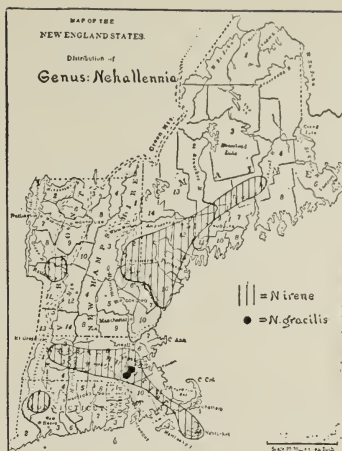
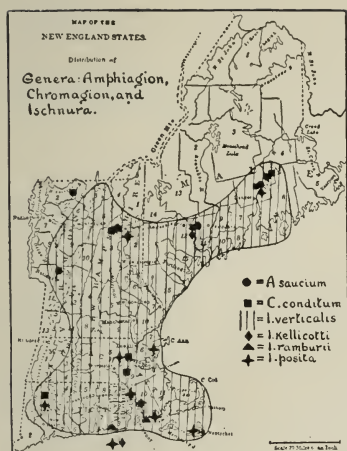
♂ and ♀ red and black above, abdomen stout.



♂ and ♀ blue and black above.

Color pattern of thorax and base of abdomen of ♂'s as seen from above, also 3rd segment of ♀'s abdomen showing relative diameter drawn to scale.





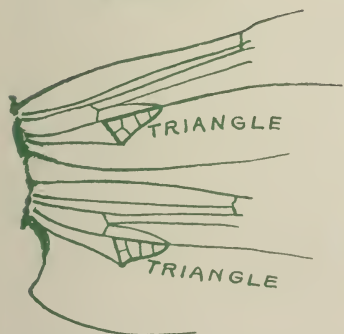
Recapitulation of New England Zygoptera—Damsel-flies

States	Agrion	Haeterina	Leuctes	Argia	Enallagma	Nephallennia	Amphigagrion	Chromagrion	Ischnura	Anomalagrion	Total species
Maine	2	1	8	2	9	1	1	1	4	1 =	30
New Hampshire	3	0	7	2	11	1	1	1	2	0 =	28
Vermont	2	0	2	1	2	1	1	0	1	0 =	10
Massachusetts	4	1	9	3	17	2	1	1	3	1 =	42
Rhode Island	1	0	3	1	3	0	0	0	4	0 =	12
Connecticut	3	0	7	2	9	1	0	1	2	0 =	25

Anisoptera: Dragon Flies.

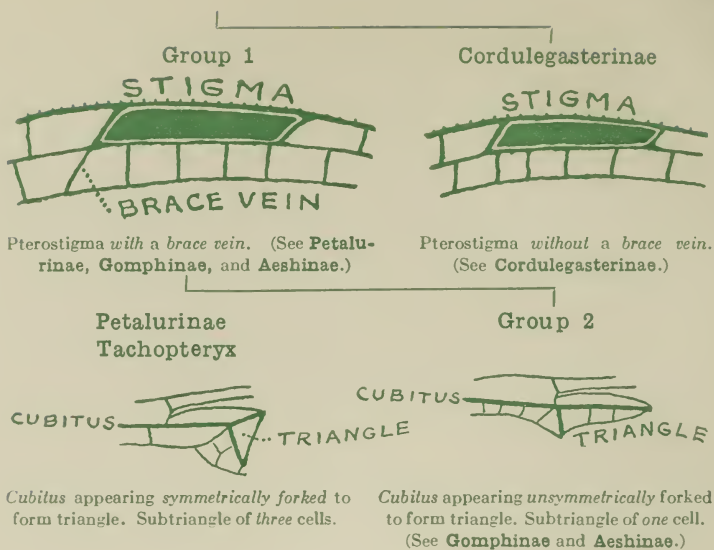
Aeshnidae

Libellulidae



Triangles of fore and hind wings in similar position and of similar shape.
(See Group 1.)

Triangles of fore and hind wings not in similar position and not of similar shape. (See Libellulidae.)



Suborder: Anisoptera.

Family: Aeshnidae.

Subfamily: Petalurinae Needham.

Genus: Tachopteryx Selys.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Tachyopteryx thoreyi		+		+		

♂ ♀ pterostigma very long (8-9.5 mm.) and narrow (.8 mm.).

44. *Tachyopteryx thoreyi* (Hagen).

Monog. Gomp. 373. 1858. Type locality: "l'Amérique septentrionale?"

Very rare.

June

New Hampshire: Manchester (Burnham).

Massachusetts: (Hagen).



♂ side view abdominal appendages.

(To be continued.)

Memoir of the Thoreau Museum of Natural History: II

Manual of the Odonata of New England

By R. HEBER HOWE, Jr.

PART III.

August 30, 1918.

NOTE: Because the distribution of the Gomphines has been so little worked out for the New England States, as evidenced by the few records for each species, the distributional maps have been omitted in this part. The habitats, and limital dates are also very insufficient, but are included wherever possible. No drawings of the male appendages of *G. adelphus* have ever been published, nor am I able to secure a specimen from which to draw them.

Subfamily: Cordulegasterinae Calvert

Genus: Cordulegaster Leach

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Cordulegaster diastatops . . .	+	+	+	+		+
maculatus . . .	+	+	+	+		+
obliquus . . .	+			+		+

A. Eyes *not* touching.

45. *Cordulegaster diastatops* Selys.

Bull. acad. Belg. **21**: 101. 1854. Type locality: "Columbie."
(Probably error for District of Columbia, U. S.)

Uncommon,—open woods, brooks, and rapid woodland streams.

May 28 to August.

Maine: Greenfield, Bradley, Orono (Harvey); Manchester (Wadsworth); Portland (M. C. Z.).

New Hampshire: White Mts. (Selys); Franconia (Slosson); Waterville (M. C. Z.); Peterboro (Cabot); Jackson (Morse); Intervale (Allen).

Vermont: Jay, Troy (Morse).

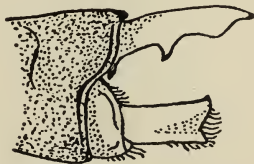
Massachusetts: Sherborn (Babcock); West Bridgewater (Tower); Concord (Howe); Framingham (Johnson); Newtonville (Thaxter); Waltham (Bullard); Southbridge (Bromley); Winchendon (Morse).

Connecticut: Litchfield (Woodruff).

B. Eyes *touching*.

46. *Cordulegaster maculatus* Selys.

Bull. acad. Belg. **21**: 105. 1854. Type locality: "Georgie Americaine."



Side view male appendages.

Uncommon,— open woods, brooks.

June 1 to August 7.

Maine: Greenfield, Orono (Harvey);
Manchester (Wadsworth).

New Hampshire: Manchester (Burn-
ham); North Conway, Intervale (Allen);
Pemigewasset pond; Meredith (Calvert);
Franconia (Howe).

Vermont: Bennington (Johnson).

Massachusetts: Woburn (Hagen); Worcester (Hitchings); West
Bridgewater: (Tower); Concord (Howe); Chester (Johnson); Brookline
(Shurtleff); Southbridge (Bromley).

Connecticut: (Hagen); Litchfield (Woodruff).



47. **Cordulegaster obliquus** (Say).

Journ. acad. nat. sci. Phila., 8: 15. 1839. Type locality: "Indiana."

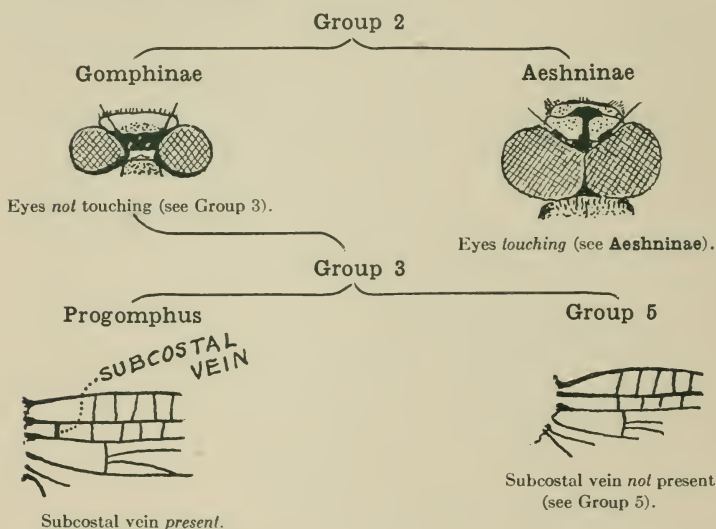
Uncommon,— open woods.

May 28 to July 7.

Maine: Bradley, Orono (Har-
vey); Manchester (Wadsworth).

Massachusetts: Andover (Selys);
Brookline (Hagen); Framingham
(Johnson); Southbridge (Bromley).

Connecticut: (Hagen).



Subfamily: Gomphinae Rambur

Genus: Progomphus Selys

Me. N. H. Vt. Mass. R. I. Conn.

Progomphus obscurus

+

48. **Progomphus obscurus** * Rambur.

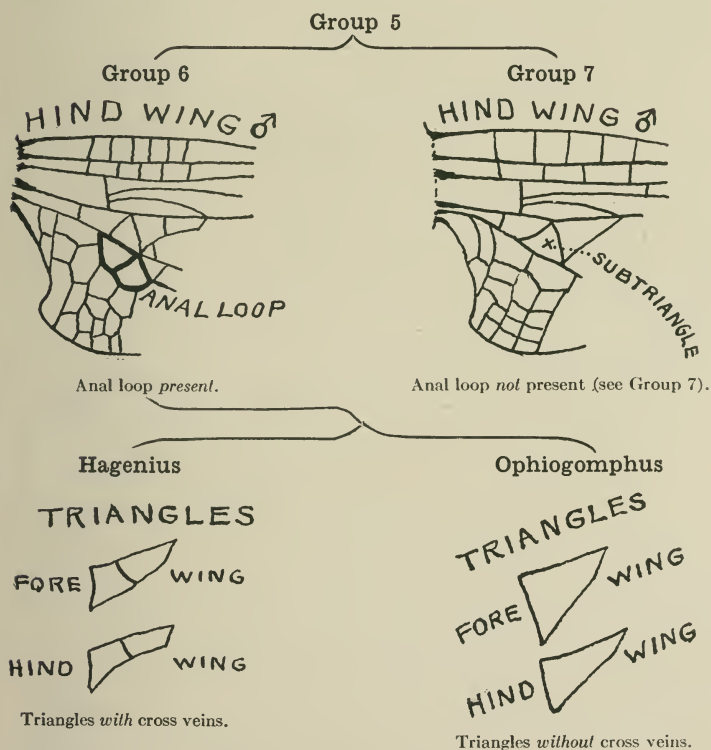
Ins. Nevv. 170. 1842. Type locality: "l'Amerique septentrionale."

June 5 to August 9.

Very rare,— scrub oak uplands, rivers and lakes.

Massachusetts: Boston, (Hagen); Wareham (Bangs).

* = Gomphoides.



Genus: Hagenius Selys

Me. N. H. Vt. Mass. R. I. Conn.

Hagenius brevistylus + + + +

49. **Hagenius brevistylus** Selys.

Bull. acad. Belg. **21**: 82. 1854. Type locality: "Columbie" (probably error for District Columbia, U. S.).

Common,—swift mountain brooks,
and rivers, ponds and lakes.

June to September 3.

Maine: North East Carry, Greenfield,
Orono, Bradley (Harvey); Manchester
(Wadsworth).

New Hampshire: Manchester (Burnham); Peterboro (Cabot);
Meredith Neck, Moultonboro (Howe).

Massachusetts: Sherborn (Babcock); Sutton (Hagen); Concord
(Howe); Winchendon (Morse).

Connecticut: Litchfield (Woodruff); Mashapaug (Bromley).



Genus: Ophiogomphus Selys

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Ophiogomphus anomalus</i> . . .	+					
<i>mainensis</i> . . .	+					
<i>carolus</i> . . .	+					
<i>colubrinus</i> . . .	+					
<i>johannus</i> . . .	+					
<i>rupinsulensis</i> . . .	+					+
<i>aspersus</i> . . .	+					+

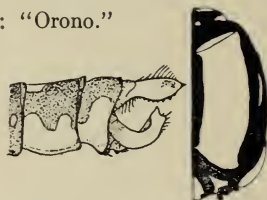
50. **Ophiogomphus anomalus** Harvey

Ent. News **9**: 60. 1898. Type locality: "Orono."

Very rare.

June 6–15.

Maine: Orono (Harvey).



51. **Ophiogomphus mainensis**
Packard.

Proc. ent. soc. Phila. **2**: 255. 1863.

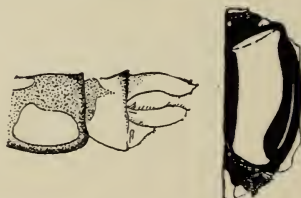
Type locality: "northern part of the
State of Maine."

Very rare,—1400 ft.

Maine: (Packard).

New Hampshire: White Mts.
(Selys); Franconia (Slosson).

Side view of male abdominal
appendages, and thorax as seen
from above (both sexes).



NOTE: The drawing of the male appendages is made from the Hagen type in
the Museum of Comparative Zoology — they resemble very closely those of *O. carolus*.

52. **Ophiogomphus carolus** Needh.

Can. ent. 29: 183. 1897. Type locality:
"Ithaca, N. Y."

Very rare,—

May to June.

Maine: Greenfield, Bradley, Orono (Harvey).



53. **Ophiogomphus colubrinus** Selys.

Bull. acad. Belg. 21: 40. 1854. Type
locality: "Territoire de la baie d'Hudson."

Rare,—

Maine: Orono (Hagen).

New Hampshire: White Mts. (Banks).



54. **Ophiogomphus johannus** Needh.

Can. ent. 29: 182. 1897. Type locality:
"Wilmurt, N. Y."

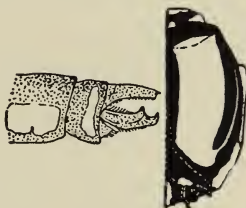
Rare,— mountain brooks, and small
rivers.

May 27 to July 11.

Maine: Bradley (Harvey).

New Hampshire: Merrimac valley (Howe).

Connecticut: Litchfield (Woodruff).



55. **Ophiogomphus rupinsulensis** (Walsh).

Proc. acad. nat. sci. Phila.; 388. 1862.
Type locality: Rock Island, Illinois.

Rare,— small streams, rapid rivers,
and windward shores of lakes.

August.

Maine: N. E. Carry, Russell Stream (Harvey); Eagle Lake
(M. C. Z.); (Uhler).

New Hampshire: Manchester (Burnham).

Connecticut: New London (Osburn).



56. **Ophiogomphus aspersus** Morse.

Psyche 7: 209. 1895. Type locality:
"northeastern U. S."

Rare,—ledges, woodlands, brooks,
200-2200 ft. alt.

May 26 to August 29.

Maine: N. E. Carry, Russell Stream
(Harvey).

New Hampshire: Intervale, Mt. Bartlett (Allen).

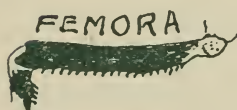
Massachusetts: Great Barrington (Johnson); Concord (Howe);
Wellesley (Morse).



Group 7

Gomphus

Dromogomphus



Hind femora naked or with
short spines.



Four to seven long spines on
femora
(see **Dromogomphus**).

Genus: Gomphus Leach

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Gomphus albistylus	+	+				+
parvulus	+	+		+		
abbreviatus	+	+		+		+
brevis	+	+				+
quadricolor				+		
lividus				+		+
exilis	+	+		+	+	+
ventricosus				+		
scudderi	+					
vastus		+		+		
fraternus		+				
adelphus				+		
notatus		+	?	+		
spiniceps				+		
borealis		+		+		
spicatus	+	+		+		+
furcifer				+		
pallidus				+		

A. Triangle of fore wings *distinctly shorter* ($\frac{1}{3}$) than that of hind wing (=Subgenus: *Lanthus* Needham. I can see no good reason for recognizing *Lanthus* as a full genus).

a. Abdomen *not over* 31 mm. long.

57. ***Gomphus albistylus*** Hagen.

Bull. acad. Belg. 46: 460. 1878. Type locality: "Le Maine."

Uncommon,—brooks, and small rivers.

June 24 to August 1.

Maine: Bradley (Harvey).

New Hampshire: Manchester (Burnham); Franconia (Howe).

Connecticut: Litchfield (Woodruff); New Canaan (Atwater).



58. ***Gomphus parvulus*** Selys.

Bull. acad. Belg. 21: 56. 1854. Type locality: "Nouvelle-Ecosse."

Rare,—rivers.

May 26 to July 1.

Maine: Manchester (Wadsworth).

New Hampshire: White Mts. (Hagen); Franconia (Slosson, Howe); Peterboro (Cabot).

Massachusetts: North Reading, East Walpole (Johnson).



B. Triangle of fore wing *only slightly shorter* ($\frac{1}{4}$) than that of hind wing (= Genus: *Gomphus*).

59. ***Gomphus abbreviatus*** Hagen.

Bull. acad. Belg. 46: 464. 1878. Type locality: "Provincetown (Massachusetts)...Orono (Maine)."

Uncommon,—

June 7 to July.

Maine: South Lagrange, Orono (Harvey); Manchester (Wadsworth).

New Hampshire: Manchester (Burnham).

Massachusetts: Provincetown (Hagen).

Connecticut: Winnipauk (Johnson).



60. **Gomphus brevis** Hagen.

Bull. acad. Belg. **46**: 462. 1878. Type locality: "Schoarie (Etat de New-York)...Port-Neuf (Canada)."

Uncommon,— brooks and rivers.

May 31 to July 8.

Maine: Orono; Bradley, South Lagrange (Harvey).

New Hampshire: Intervale (Allen).

Connecticut: Litchfield (Woodruff).



61. **Gomphus exilis** Selys.

Bull. acad. Belg. **21**: 55. 1854. Type locality: "Etat-Unis."

Common,— ponds, slow rivers, woodlands, and roads.

May 19 to August 8.

Maine: South Lagrange, Orono Bradley (Harvey); Mt. Desert (Bullock); Manchester (Wadsworth).

New Hampshire: Manchester (Burnham); Peterboro (Cabot); Meredith Neck, Moultonboro, Franconia, Lisbon (Howe); Intervale, North Conway (Allen); Peterboro (Cabot).

Massachusetts: Salem, Brookline, Natick, Sutton (Hagen); Worcester (Hitchings); Concord (Howe); Newton, Tyngsboro, Framingham, Rutland, North Reading (Johnson); Wareham (Bangs); Medfield, Sherborn (Morse); Provincetown (?).

Rhode Island: Wickford (Johnson).

Connecticut: New Haven (Walden); Litchfield (Woodruff); New London (Osburn).

b. Abdomen *between* 32 and 38 mm. long.

62. **Gomphus quadricolor** Walsh.

Proc. ent. soc. Phila., **2**: 246. 1863. Type locality: Rock Island, Illinois.

Very rare,—gravelly, rocky rivers.

Massachusetts: Mt. Tom (Hagen).



63. **Gomphus lividus** Selys.*

Bull. acad. Belg., **21**: 53. 1854. Type locality: "Caroline du Sud."

Uncommon,— brooks.

May 28 to July 7

* = sordidus Hagen.



Massachusetts: Natick (Hagen).

Connecticut: Litchfield (Woodruff); New London (Osburn).

64. **Gomphus ventricosus** Walsh.

Proc. ent. soc. Phila., 2: 249. 1863. Type locality: Rock Island, Illinois.

Very rare,—rivers.

June 14 to 16.

Massachusetts: (Selys); Great Barrington (Johnson); Mt. Tom (M. C. Z.).



65. **Gomphus vastus** Walsh.

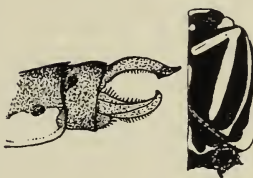
Proc. acad. nat. sci. Phila., 391. 1862. Type locality: Rock Island, Illinois.

Rare,—rivers and lakes.

July 13 to

New Hampshire: Manchester (Burnham).

Massachusetts: Tyngsboro (Hagen).



66. **Gomphus fraternus** (Say).

Journ. acad. nat. sci. Phila., Ser. 1: 16. 1839. Type locality: "U. S."

Very rare,—rivers.

New Hampshire: "Probably" (Hagen).



67. **Gomphus adelphus** Selys.

Monog. gomph. 413. 1858. Type locality: "New York."

Very rare,—

Massachusetts: Tyngsboro (Hagen).



68. **Gomphus borealis** Needham.

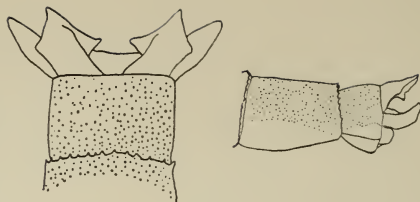
Bull. 47. N. Y. st. mus. 453. 1901. Type locality: "Saranac Inn" N. Y., "Franconia, N. H."

Rare,—

May to June 21

New Hampshire: Franconia (Slosson); Intervale (Allen).

Massachusetts: ?Concord (Howe).



Male appendages from above

NOTE: Dorsal thoracic marking same as in following species.

69. **Gomphus spicatus** Hagen.

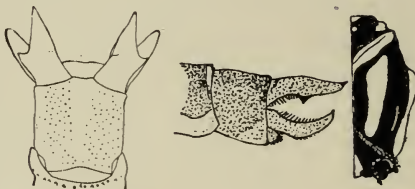
Bull. acad. Belg. 21: 54. 1854. Type locality: "New York."

Common, about ponds, lakes.

May 15 to July 13

Maine: South Lagrange, Oldtown, Orono (Harvey); Manchester (Wadsworth).

New Hampshire: Franconia (Slosson, Howe); Intervale (Allen); Peterboro (Cabot); Pemigewasset pond (Calvert).



Male appendages from above.

Massachusetts: Natick (Hagen); Sherborn (Babcock); Concord (Howe); Winchendon (Russell); Boston (Parshley); Bedford (Swett); Southbridge (Bromley).

Connecticut: Litchfield (Woodruff).

NOTE: Through the kindness of Dr. Calvert, I am able to give figures (side view) of the male appendages of *G. borealis*, and comparative drawings of the appendages of *G. borealis* (from above) and *G. spicatus* (from above). The drawings were made by Dr. Calvert from material in the collection of the Academy of Natural Science, Phila., Pa.

70. **Gomphus furcifer** Hagen.

Bull. acad. Belg. 46: 458. 1878. Type locality: "Natick (Massachusetts)... Lansing (Michigan)."

Rare,— open meadows, ponds, and small lakes.

May 29 to July 28.

Massachusetts: Natick (Hagen); Southbridge (Bromley); Belmont (Bullard); Tyngsboro (Blanchard); Lexington (Banks); Stockbridge (Calvert); Concord (Howe).



c. Abdomen *between* 38 and 44 mm. long.

71. **Gomphus scudderi** Selys.

Bull. acad. Belg. **35**: 752. 1873. Type locality: "Etats-Unis."

Rare,— small, rapid rivers.

August 27–29.

Maine: North East Carry (Harvey).



72. **Gomphus notatus** Ramb.

Ins. Nevr. 162. 1842. Type locality: "sans indication de patrie."

Very rare,— large rivers.

Massachusetts: Crampton* (Hagen).

* There is no such town in Massachusetts. The locality intended is probably Campton, N. H.



73. **Gomphus pallidus** Ramb.

Ins. Nevr. 163. 1842. Type locality: "l'Amerique septentrionale."

Rare,—

Massachusetts: Waltham (Hagen).

d. Abdomen *over* 46 mm. long.



74. **Gomphus spiniceps** (Walsh).

Proc. acad. nat. sci. Phila., 389. 1862. Type locality: Rock Island, Illinois.

Rare,— large rivers.

July

Massachusetts: Lawrence (Hagen); Concord (Howe).



Genus: Dromogomphus Selys

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Dromogomphus spinosus . . .	+	+		+		+

75. **Dromogomphus spinosus** Selys.

Bull. acad. Belg. 21: 59. 1854. Type locality: "Etat-Unis, Georgie."

Common,— about ponds, lakes, and rivers.

June 28 to September 1.

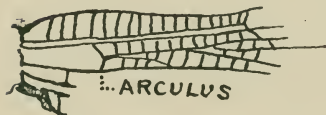
Maine: Orono, Oldtown (Harvey); Manchester (Wadsworth).

New Hampshire: Manchester, Lake Winnepesaukee (Burnham) Meredith Neck, Newfound Lake, Moultonboro (Howe) Sharon (Cushman); Squam Lake (Allen).

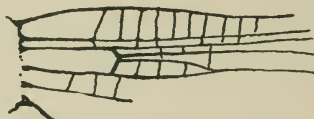
Massachusetts: Worcester (Hitchings); Concord (Howe); Fall River (Easton); Brookline (M. C. Z.); Boston (Allen); Wareham (Bangs); Worcester, Sherborn (Morse).

Connecticut: Litchfield, West Hartford (Woodruff); Mashapaug (Bromley); New London (Osburn).

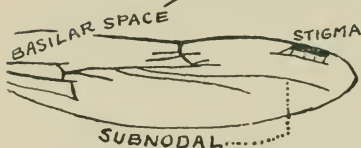
Subfamily: Aeshninae Rambur



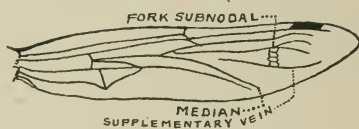
Upper half of arculus *not* shorter than lower.



Upper half of arculus *shorter* than lower. (See Genus: **Anax**)



Subnodal (radial) vein *unforked*.



Subnodal (radial) vein *forked*. (See Group 1)



Three or more cubito-anal cross veins.



Two cubito-anal cross veins. (See Genus: **Gomphaeschna**)

(To be continued)

Additional Stations and Corrections

PART I

Agrion amatum

July 29 rivers

Agrion æquabile

May 10 rivers

New Hampshire: Intervale (Allen); Pemigewasset pond (Calvert).

Vermont: Bennington (Johnson); Williamsville (Clench).

Massachusetts: Framingham (Frost); Southbridge (Bromley); Blue Hills (Clench); Wollaston (M. C. Z.).

Agrion maculatum

New Hampshire: Intervale (Allen); Franconia, Lisbon (Howe); Fitzwilliam (Barnes).

Massachusetts: Southbridge (Bromley); Waltham, Belmont (M. C. Z.); Wellesley (Morse).

Connecticut: New Canaan (Atwater); New Haven (Osburn).

Hetaerina americana

Massachusetts: Southbridge (Bromley); Cambridge (M. C. Z.).

Lestes eurinus

June 5

New Hampshire: North Conway (Allen).

Massachusetts: Southbridge (Bromley); Wayland (Howe).

Lestes congener

New Hampshire: Intervale (Allen).

Massachusetts: East Orleans (Parker); Brookline (Johnson); Woods Hole (Calvert).

Lestes unguiculatus

June 15

Maine: Machias (Johnson).

New Hampshire: Intervale (Allen).

Massachusetts: West Peabody (Little); East Orleans (Parker); Woods Hole, Nonameset Island (Osburn); Barnstable, Dedham, Eastham, Fall River, Chatham, Great Barrington (Johnson); Horse Neck Beach (Holt).

Rhode Island: Tiverton (Johnson); Bristol (Johnson).

Connecticut: Sachem Head (Calvert); New London (Osburn).

Lestes uncatus

May 30

New Hampshire: Intervale (Allen).

Vermont: St. Albans (Johnson).

Massachusetts: Southbridge (Bromley).

PART II

Lestes disjunctus

June 21 to September 23

Maine: Machias (Johnson).

New Hampshire: North Conway, Intervale (Allen); Jackson (Skinner); Franconia, Lyman, Lisbon (Howe).

Massachusetts: Provincetown, Martha's Vineyard (Johnson); Southbridge (Bromley).

Lestes forcipatus

Massachusetts: *strike out* Woods Hole (U. S. N. M.)

Lestes rectangularis

June 20

New Hampshire: Intervale, North Conway (Allen).

Massachusetts: West Peabody (Little); East Orleans (Parker); Eastham,

Martha's Vineyard, Cheshire (Johnson); Southbridge (Bromley).
Rhode Island: Bristol (Johnson).
Connecticut: Sachem Head (Calvert); New London (Osburn).

Lestes vigilax

May 28

New Hampshire: North Conway, Squam Lake (Allen); Meredith Neck (Howe).
Massachusetts: Framingham (Johnson); Southbridge (Bromley).
Rhode Island: *strike out* Meredith Neck (Calvert).
Connecticut: Sachem Head (Calvert).

Lestes inequalis

New Hampshire: Intervale (Allen).
Massachusetts: Southbridge (Bromley).
Rhode Island: Bristol (Johnson).

Argia moesta

June 16

Maine: Bowlin pond (?); *strike out* Pudding pond (Allen).
New Hampshire: Squam Lake (Allen); Pudding pond, North Conway (Allen);
Fitzwilliam (Barnes).
Massachusetts: Brimfield (Bromley).

Argia violacea

sandy roads.

New Hampshire: Intervale (Allen); Littleton (Howe); Fitzwilliam (Barnes).
Massachusetts: Plymouth (Johnson); Southbridge (Bromley).
Connecticut: New Canaan (Atwater); New London (Osburn); Sherborn (Morse).

Note: *fifth line for Williamson read Calvert.*

Enallagma durum

July 23

Massachusetts: Nantucket (Cushman).

Enallagma cyathigerum

June 25

New Hampshire: Intervale (Allen); Pemigewasset pond (Calvert).
Massachusetts: Provincetown (Johnson); Cotuit (Peirson).

Enallagma hageni

May 30 to August 6

Maine: Machias, Calais, Princeton (Johnson); Bethel, Norway (M. C. Z.).
New Hampshire: Intervale (Allen); Franconia, Lisbon, Littleton (Howe); No.
Conway (M. C. Z.).
Massachusetts: North Reading, Blue Hills (Johnson); Bedford (Swett); Franconia
(Howe); Wellesley (Morse); Cambridge, Norfolk Co. (M. C. Z.).

Enallagma calverti

May 19

Massachusetts: Auburndale (Johnson).
Rhode Island: Matoonoc (Simonds).

Enallagma ebrium

May 26

Maine: Princeton (Johnson).
New Hampshire: Franconia, Lyman (Howe).
Vermont: Burlington (Johnson).
Massachusetts: Mt. Greylock (Calvert); Brookline, Washington, Cheshire
(Johnson); Southbridge (Bromley); Wayland (Howe); Cambridge, Norfolk Co.
(M. C. Z.).
Rhode Island: Bristol (Johnson).
Connecticut: Sachem Head (Calvert); New London (Osburn).

Enallagma traviatum

July 16

Massachusetts: *strike out* Hingham (Barnes).

Enallagma aspersum

July 21

New Hampshire: Intervale (Allen).

Massachusetts: Hingham (Barnes).

Connecticut: Sachem Head (Calvert).

Enallagma doubledayi

June 29

Enallagma minusculum

June 27

Maine: Echo Lake, Mt. Desert (Johnson).

Massachusetts: Manomet, Eastham (Johnson).

Enallagma carunculatum

July 28

Massachusetts: Stockbridge Bowl (Calvert).

Enallagma civile

September 8

Massachusetts: West Peabody (Little); East Orleans (Parker); Nonamesset Island, No Man's Land (Osburn); Tuckernuck (Allen); Cohasset (Bryant); Fall River (Cushman); Manomet, Eastham, Edgartown (Johnson); Southbridge (Bromley); Natick, Nahant (M. C. Z.); West Chop, Provincetown (Morse).

Rhode Island: Matoonac (Simonds); Bristol (Parker).

Connecticut: Sachem Head (Calvert).

Enallagma divagans

June 8

New Hampshire: Pemigewasset pond (Calvert).

Massachusetts: North Reading (Johnson); Concord (Howe); Winchendon (Morse).

Connecticut: *strike out* Litchfield (Woodruff); Middletown (Johnson); New Canaan (Atwater).

Enallagma geminatum

Massachusetts: Bedford (Swett); Auburndale (Johnson).

Enallagma exulans

May 28 to August 27

Massachusetts: Rutland, Framingham (Johnson); Bedford (Swett); Concord (Howe); Dover (Morse).

Rhode Island: Buttonwoods (Johnson).

Connecticut: Winnipauk (Johnson); New London (Osburn).

Enallagma signatum

June 17

Maine: Princeton (Johnson).

Vermont: St. Albans (Johnson).

Massachusetts: West Peabody (Little); Brookline (Johnson); Cambridge (M. C. Z.);

Cotuit (Peirson); Medfield (Morse).

Connecticut: Winnipauk, Middletown (Johnson).

Enallagma pollutum

June 8 to September 6

Massachusetts: West Peabody (Little); Brookline (Johnson); Bedford (Swett).

Nehalennia irene

May 28 to August 23

Maine: Machais, Naples, Calais, Princeton (Johnson); Wales (Frost).

New Hampshire: Intervale, North Conway (Allen); Franconia, Littleton (Howe).

Vermont: Burlington (Johnson).

Massachusetts: Framingham, Duxbury, Winchendon, Brookline (Johnson); West Peabody (Little); Mt. Greylock (Calvert); Woods Hole (Osburn); Cambridge, Natick (M. C. Z.); Cotuit (Peirson); Sherborn, Wellesley, Provincetown, Winchendon (Morse).

Rhode Island: Buttonwoods (Johnson).

Connecticut: Sachem Head (Calvert); New London (Osburn).

Amphiagrion saucium

June 19 to July 16

New Hampshire: Jaffrey (Johnson); Intervale (Allen); Lyman (Howe).

Massachusetts: Wellesley, Sherborn (Morse).

Rhode Island: Buttonwoods, Bristol (Johnson).

Connecticut: New Canaan (Atwater).

Chromagrion conditum

New Hampshire: Intervale (Allen); Franconia (Howe).

Massachusetts: Duxbury (Johnson); Woods Hole (Osborn); Wellesley (Morse).

Ischnura verticalis

May 14

Maine: Ashland Junction, Calais, Princeton, Machias, Bradley (B. S. N. H.); Portland (M. C. Z.); Echo Lake, Mt. Desert, So. West Harbor (Johnson).

New Hampshire: Intervale (Allen); Jackson (Skinner); Franconia, Littleton Lisbon (Howe); No. Conway (M. C. Z.).

Massachusetts: North Reading, Framingham, Blue Hill, Groton, Dedham, Gloucester, Duxbury, Auburndale, Manomet, Washington, Eastham, Edgartown, Horse Neck Beach, Rutland (Johnson); West Peabody (Little); Stockbridge, Mt. Greylock (Calvert); Bedford (Swett); East Orleans (Parker); Tuckernuck (Allen); Southbridge (Bromley); *strike out* Bradley (B. S. N. H.); Nahant, Cambridge (M. C. Z.); Cotuit (Peirson).

Rhode Island: Tiverton, Washington (Johnson); Matoonoc (Simonds); Bristol (Parker).

Connecticut: New London (Osborn).

Ischnura ramburii

July 20

Massachusetts: Woods Hole (Osborn).

Ischnura posita

May 25 to September 6

New Hampshire: Exeter (Howe).

Massachusetts: Brookline, Dedham, Auburndale, Duxbury (Johnson); Framingham (Frost); Woods Hole (Calvert); Natick (M. C. Z.); Winchendon (Morse).

Rhode Island: Bristol (Parker).

Connecticut: Middletown (Johnson); New Canaan (Atwater).

Anomalagrion hastatum

June 22 to August 20

Massachusetts: Wellesley (Morse); Woods Hole (Osborn); Dorchester (M. C. Z.); Concord (Howe).

Rhode Island: Tiverton (Johnson).

Connecticut: Sachem Head (Calvert).

Recapitulation of New England Zygoptera

	Agria	Hetaerina	Lestes	Argia	Enallagma	Nehalennia	Amphagrion	Chromagrion	Ischnura	Anomalagrion
Maine	2	1	3	2	11	1	1	1	3	1 = 31
New Hampshire	3	0	9	2	12	1	1	1	2	0 = 31
Vermont	2	0	2	1	3	1	1	0	1	0 = 11
Massachusetts	4	1	9	3	17	2	1	1	3	1 = 42
Rhode Island	1	0	4	1	6	1	1	0	4	1 = 19
Connecticut	3	0	8	2	8	1	1	1	2	0 = 26

Memoir of the Thoreau Museum of Natural History: II

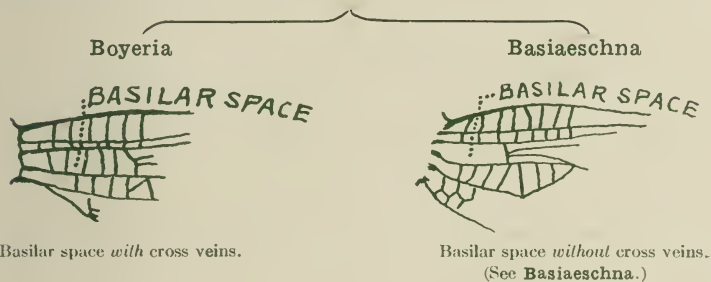
Manual of Odonata of New England

By R. HEBER HOWE, Jr.

March 25, 1919.

PART IV

NOTE: The drawings are made in many cases from the illustrations in articles by Drs. E. M. Walker, J. G. Needham, R. A. Muttkowski, C. H. Kennedy, and Mr. E. B. Williamson, and are used here with permission. No distributional maps will be given in the future parts as new stations are so frequently found that maps become obsolete almost as soon as published.



Genus: Boyeria MacLach.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Boyeria grafiana				+		
vinosa	+	+	+	+		+
A. Body markings with <i>yellowish-brown</i> predominating, wings smoky.						

76. Boyeria vinosa (Say).

Jour. acad. nat. sci. Phila. 8: 13. 1839. Type locality: "Massachusetts."

Uncommon,—brooks, rivers, lakes,—preferring shady places or semicrepuscular.

June 19 to September 13.

Maine: No. East Carry, Greenfield, Orono, Wissattiquoik river (Harvey); Mt. Desert (Bullock); Manchester (Wadsworth);

New Hampshire: Meredith Neck (Howe).

Vermont: Wolcott, Grand Isle (Morse); Brandon (Dutton).

Massachusetts: Concord (Howe); Cambridge (Hagen); Truro, Sherborn (Morse); Chester (Johnson); Fall River (Holt); Wareham (Bangs); Southbridge (Bromley).

Connecticut: Litchfield (Woodruff).

B. Body markings with *blue* predominating, wings clear.

77. **Boyeria grafiana** Williamson.

Ent. News 18: 1. 1907. Type locality: "Ohio Pyle, Penna."

One record,— July 5, 1899,— lakes.

Massachusetts: Cummington (Knab in U. S. N. M.)

Genus: *Basiaeschna* Selys.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Basiaeschna janata</i>	+	+	+	+		+

78. ***Basiaeschna janata*** (Say).

Journ. acad. nat. sci. Phila. 8: 13. 1839. Type locality: "Massachusetts."

Common,— brooks, rivers, ponds, and lakes.

May 9 to July 18.

Maine: So. Lagrange, Orono, Bradley, Westbrook, Greenfield (Harvey); Manchester (Wadsworth).

New Hampshire: White Mts. (Hagen); Peterboro (Cabot); Meredith Neck, Echo Lake, Franconia (Howe); Intervale, Squam Lake (Allen).

Vermont: Brandon (Dutton); Wolcott (Morse).

Massachusetts: Roxbury, Milton, Carver Woods (Hagen); Worcester (Hitchings); Fall River (Holt); Concord (Howe); Wareham (Bangs); Newtonville (Morse); Newton (Thaxter); Waltham (Bulard); Southbridge (Bromley).

Connecticut: Litchfield (Woodruff); New London (Osburn).

Genus: *Gomphaeschna* Selys.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Gomphaeschna furcillata</i> . .	+	+	+	+		

79. **Gomphaeschna furcillata** (Say)

Journ. acad. nat. sci. Phila. 8: 13. 1839. Type locality: "Massachusetts."

Rare,— ponds, sphagnum bogs.

May 30 to July.

Maine: Manchester (Wadsworth).

New Hampshire: Jaffrey (Johnson).

Vermont: Newport (Slosson).

Massachusetts: Manchester, Brookline, Milton, Sutton (Hagen); No. Reading (Johnson); Concord (Howe); Sherborn (Babcock); Princeton, Wollaston (Sprague).

Genus: Anax Leach.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Anax junius	+	+	+	+	+	+
longipes				+		

A. Hind wings *more than* 14 mm. wide. Frons above *blue, yellow,* and *black.*

80. **Anax junius** (Drury).

Ill. Nat. Hist. 1: 112. 1770. Type locality: "New York."

Common,— ponds, migratory
along coast.*



Frons from above.

May 18 to October 13.

Maine: Orono (Harvey); Manchester (Wadsworth).

New Hampshire: Manchester (Burnham); Amherst, Petersboro (Cabot); Meredith, Franconia (Howe).

Vermont: Brandon (Dutton).

Massachusetts: Boston, Cambridge, Springfield (Cabot); Magnolia, Brookline, Milton (Hagen); Woods Hole, Cuttyhunk Island (Calvert); Nantucket, Concord, Scituate (Howe); Fall River (Holt); Blue Hills (Clench); No. Saugus (Webster); Provincetown (Benedict); Wellesley (Morse); Manomet (Cushman); Framingham (Frost); Newtonville (Thaxter); Wareham (Bangs); Minot (M. C. Z.); Southbridge (Bromley).

Rhode Island: Middletown, Bristol (Howe); Block Island (Calvert).

* See Osburn, Journ. N. Y. Ent. Soc. 24: 90. 1916.

Connecticut: New London (Calvert); Litchfield (Woodruff); Fairfield Co. (Benedict).

B. Hind wings *less than* 14 mm. wide. Frons above *green*.

81. **Anax longipes** Hagen.

Syn. Neur. No. Amer. 118. 1861. Type locality: "Georgia."

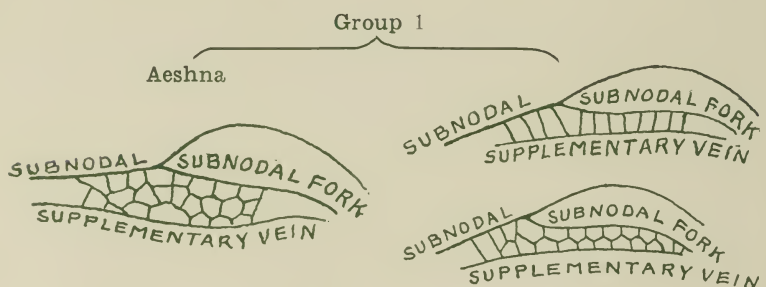
Rare, — ponds, migratory along coast.



Frons from above.

August 25.

Massachusetts: Woods Hole (Hagen); Wareham (Bangs).



Three to seven rows of cells between subnodal and supplementary veins.

One or two rows of cells between the subnodal and supplementary veins. (See Group 2.)

Genus: **Aeshna** Fabricius.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Aeshna canadensis</i>	+	+	+	+		+
<i>clepsydra</i>	+	+		+		+
<i>constricta</i>	+	+	+	+		+
<i>caerulea septentrionalis</i>		+				
<i>eremita</i>	+	+	+	+		
<i>interrupta</i>	+		+	+		
<i>juncea</i>		+				
<i>mutata</i>				+		
<i>tuberculifera</i>	+	+		+	+	+
<i>umbrosa</i>	+	+	+	+	+	+
<i>verticalis</i>	+	+	+	+	+	+

A. Rear of head in part *yellowish*.

82. **Aeshna umbrosa** Walk.

Can. Ent. 40: 380, 390. 1908. Type locality: "De Grassi Point, Ont."

Common, — streams, ponds, lakes, upland meadows.

May 6 to October 31.

Maine: Manchester, Augusta (Wadsworth); Norway (Smith); Gorham (?); Millinocket, Bradley, Greenfield, Six Ponds (Harvey); Russell Stream (Corry).

New Hampshire: Franconia (Slosson, Howe); White Mts. (Sprague); Hermit lake, Mt. Washington (Seuder); Center Harbor (?); Lake Sunapee, Meredith Neck, Peterboro, Lonesome Lake (Howe).

Vermont: Brandon (Dutton).

Massachusetts: Boston, Cambridge (?); Amherst (Needham); Wilbraham (Martin); Auburndale, Gay Head (?); Mt. Greylock, Stockbridge (Calvert); Sherborn (Frost); Rutland (Johnson); Fall River (Easton); Nonquitt (Baldwin); Belmont, Concord (Howe); Wareham (Bangs); Waltham (Bullard); Southbridge (Bromley).

Rhode Island: Bristol (Parker, Clark).

Connecticut: Litchfield (Woodruff).

B. Rear of head *entirely black*.

a. *Black line across face*.

I. Thoracic bands *interrupted* resulting in *spots*.

83. **Aeshna interrupta** Walk.

Can. Ent. 40: 381, 387. 1908. Type locality: "Nipigon, Ont."

Rare, — ponds, lakes.

July 17 to September 15.

Maine: Portland (Jones).

Vermont (Frost).

Massachusetts: (Uhler); Mt. Greylock (Calvert); Heath (Warden).

II. Thoracic bands *not interrupted*.

1. *First thoracic band bent forward at upper end into an anterior spur*.

84. **Aeshna clepsydra** Say.

Journ. acad. nat. sci. Phila. 8: 12. 1839. Type locality: "Massachusetts."



Female abdominal appendages from below. Side, and view from above of male abdominal appendages, and side view of thoracic markings of both sexes.



Common,—ponds, lakes, rivers.

July 6 to October 9.

Maine: Manchester (Wadsworth);
Mt. Ktaadin, So. Lagrange, Greenfield,
Bradley, Orono (Harvey).

New Hampshire: Moultonboro
(Howe); Hermit Lake (Scudder);
Fabyan's (Calvert); Manchester (Burn-
ham); No. Conway (Morse).

Massachusetts: Sherborn (Babcock); Brookline (Shurtleff);
Provincetown (Benedict); Wilbraham (Hagen); Boston (Uhler);
Salem (True); Natick (Sanborn); Concord, Nantucket (Howe);
Sherborn (Morse); Wareham (Bangs).

Connecticut: Litchfield (Woodruff); New London (Osburn).

2. *First thoracic band not bent forward at upper end into an
anterior spur.*

* *First thoracic band straight with borders nearly parallel,
without posterior spur at upper end.*

85. *Aeshna juncea* (Linn.).

Sys. Nat. 1: 544. 1758. Type locality: "Europa."

Rare,—

August.

New Hampshire: White Mts. (Hagen,
Scudder); Franconia (Slosson).

***First thoracic band straight
with borders not parallel,
front border excavated, up-
per end with a detached
posterior spur.*

86. *Aeshna eremita* Scudder.

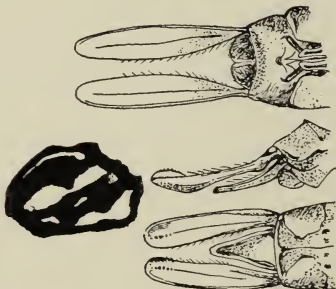
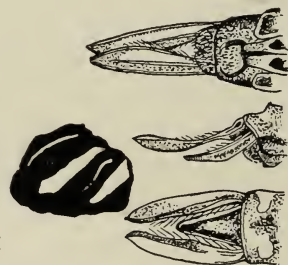
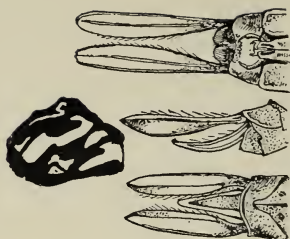
Proc. Bost. soc. nat. hist. 10: 215. 1866. Type locality: "White
Mts.," Hermit Lake.

Rare,—ponds, lakes.

August 1 to October 1.

Maine: Six Ponds, Piscataquis
Co. (Harvey).

New Hampshire: Franconia
(Slosson); Hermit Lake, Mt. Wash-
ington (Scudder); Profile Lake,
Lonesome Lake, Moultonboro
(Howe); No. Conway (Holt); Tuck-
erman's Ravine (Scudder).



Vermont: Brandon (Dutton).

Massachusetts: Fall River (Holt); Concord (Howe).

*** *First thoracic band curved (sigmoid), slender, with detached spots at both ends.*

87. **Aeshna caerulea septentrionalis** Burm.

Handb. Ent. 2: 839. 1839. Type locality: "Labrador."

Rare,—

New Hampshire: White Mts. (Scudder, Hagen).

b. *No black line across face.*

I. *First thoracic band without posterior spur at upper end.*

88. **Aeshna mutata** Hagen.

Syn. Neur. No. Amer. 124. 1861.

Type locality: "North America."

Rare,—

Massachusetts: Wilbraham (Needham).

II. *First thoracic band with posterior spur at upper end.*

1. *First thoracic band with wide, blunt, posterior spur at upper end.*

89. **Aeshna verticalis** Hagen.

Syn. Neur. No. Amer. 122. 1861. Type locality: "Washington, New York."

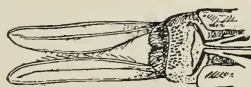
Common,—ponds, lakes, upland meadows,—migratory along coast.

August 2 to October 2.

Maine: Manchester (Wadsworth); West Beach (Hagen); Orono, Bradley (Harvey); Manchester (Wadsworth); Islesboro (Dixon); Wells (Deane).

New Hampshire: Meredith Neck (Howe); Manchester (Burnham).

Vermont: Brandon (Dutton).



Massachusetts: Beverly, Cambridge, Saugus, Sherborn (?); Nahant (Moring); Salem (Lane); Walpole, Wollaston (Sprague); Westboro (Needham); Kingston, Concord (Howe); Worcester (Hitchings); Provincetown (Morse); Nonquitt (Baldwin); Magnolia (M. C. Z.); Southbridge (Bromley).

Rhode Island: Middletown (Howe).

Connecticut: Litchfield (Woodruff); New London (Osburn)

2. *First thoracic band with slender, acute posterior spur at upper end.*

* *First thoracic band straight (stout), with borders nearly parallel.*

90. **Aeshna tuberculifera** Walk.

Can. Ent. 40: 385, 387. 1908. Type locality: "Isleboro, Me."

Uncommon,— ponds.

August 5 to September 22.

Maine: Islesboro (Dixon); Manchester (Wadsworth).

New Hampshire: North Conway (Holt).

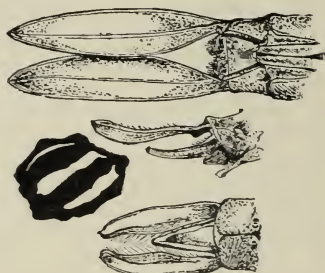
Massachusetts: Walpole (Sprague); Essex Co. (Hagen); Provincetown (Benedict, Zabriskie); Hampden, Westboro (Needham); Concord (Howe); Dedham, Rutland (Johnson).

Rhode Island: Bristol (Howe).

Connecticut: Litchfield (Woodruff).

** *First thoracic band with borders not parallel.*

† *First thoracic band with front border only excavated.*



91. **Aeshna canadensis** Walk.

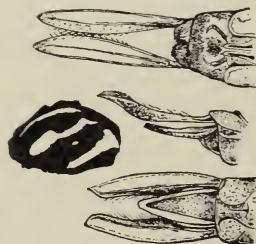
Can. Ent. 40: 382. 1908. Type locality: "De Grassi Point, Ont."

Common,— rivers, ponds, lakes, and meadowlands.

July 20 to September 26.

Maine: Bradley, Orono, Six Ponds, Piscataqua Co. (Harvey); Manchester (Wadsworth); Norway (Smith); West Beach (M. C. Z.).

New Hampshire: White Mts. (Shurtleff, Calvert); Franconia (Calvert); Fabryan's (?); Moultonboro, Lyman, Meredith Neck, Jackson (Howe); Fitzwilliam



(Barnes); Hermit Lake, Mt. Washington, Carter's Notch, Intervale, No. Conway (Allen).*

* See under *A. eremila*, Can. Ent. 51: 13. 1919.

Vermont: Newport (Slosson); Brandon (Dutton).

Massachusetts: (Needham); Concord (Howe); Dedham, Boston (Johnson); Mt. Greylock (Calvert); Wareham (Bangs); Beverly, Nahant (M. C. Z.).

Connecticut: Litchfield (Woodruff).

†† First thoracic band with both borders excavated.

92. *Aeshna constricta* Say.

Journ. acad. nat. sci. Phila. 8: 11. 1839. Type locality: "Indiana."

Common,—ponds, rivers.

June 19 to October.

Maine: No. East Carry, Mt. Kineo, Mt. Ktaadin, Orono, Fryeburg (Harvey); Manchester (Wadsworth).

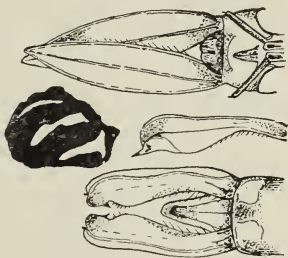
New Hampshire: Hermit Lake, Fab-yan's (Calvert); Manchester (Burnham); Intervale, Carter's Notch (Allen).*

Vermont: Winooski (Davis); Brandon (Dutton).

Massachusetts: Boston (Cabot); Worcester (Hitchings); Auburn-dale (Johnson); Concord (Howe); Fall River (Holt); Hampden (Needham); Wellesley (Morse); Southbridge (Bromley).

Connecticut: (Hagen); Litchfield (Woodruff); New London (Osburn).

* The mountain records quite likely refer to *A. umbrosa*, and were made before the species was described.



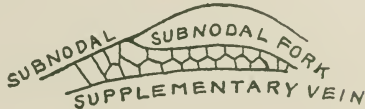
Group 2.

Nasiaeschna



With one row of cells between subnodal and supplementary veins.

Epiaeschna



With two rows of cells between subnodal and supplementary veins.
(See *Epiaeschna*).

Genus: *Nasiaeschna* Selys.

Nasiaeschna pentacantha . . . Me. N. H. Vt. Mass. R. I. Conn.
+

93. **Nasiaeschna pentacantha** (Ramb.).

Ins. Neur. 208. 1842. Type locality: "Neuve-Orléans."

Rare,— streams and lakes,— one record.

July 9, 1916.

New Hampshire: Moultonboro (Howe).

Genus: *Epiaeschna* Hagan.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Epiaeschna heros</i>	+	+		+	+	+

94. ***Epiaeschna heros*** (Fabr.).

Ent. syst. suppl. 285. 1798. Type locality: "America boreali."

Common,— ponds, lakes, uplands,— largely maritime.

May 25 to September.

Maine: Bradley (Harvey); Manchester (Wadsworth); Portland (Cabot); York Beach (Burnham).

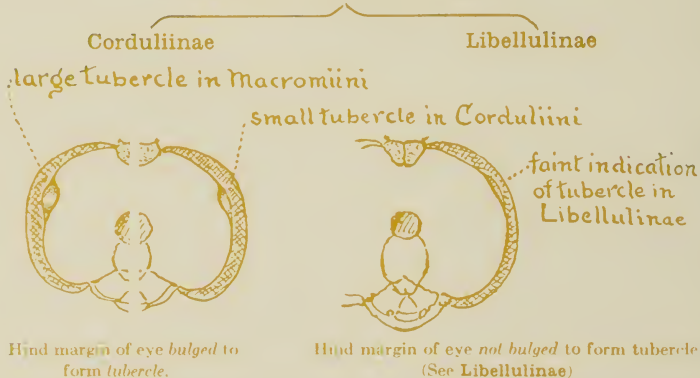
New Hampshire: Manchester, Hampton (Burnham).

Massachusetts: Manchester, Nahant, Milton (Hagen); Worcester (Hitchings); Marthas Vineyard (Moore); Fall River (Holt); Brookline, Concord, Hull (Howe); Boston (Johnson); Melrose Highlands (Clemons); Cambridge (Henshaw); Essex Co., Andover (Hagen); Waltham (Lathrop); Wollaston (Sprague); Southbridge (Bromley).

Rhode Island: Providence (Davis); Buttonwoods (Johnson).

Connecticut: Litchfield ? (Woodruff); New London (Osburn).

Family: *Libellulidae* Rambur.



NOTE: The above character can best be seen after removal of head.

Genus: Macromia Rambur.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Macromia illinoiensis</i>	+	+		+	+	

96. *Macromia illinoiensis* Walsh.

Proc. acad. nat. sci. Phila. 397. 1862. Type locality: Rock Island, Illinois.

Uncommon,—larger streams, lakes, roads.

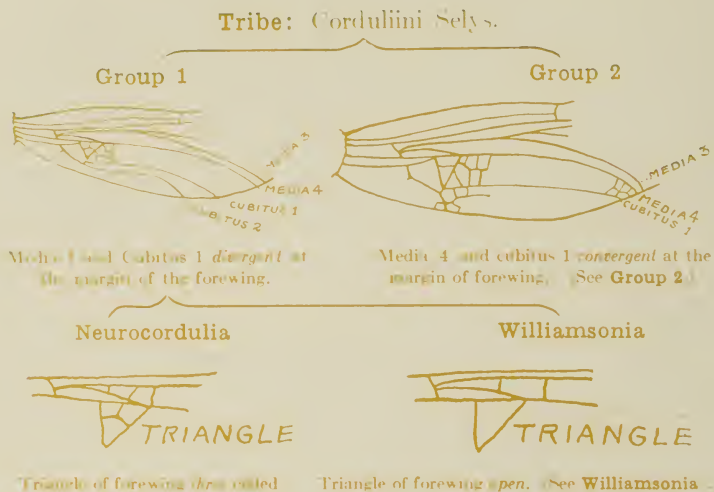
June 18 to August 16.

Maine: Orono, Bradley (Harvey); Manchester (Wadsworth).

New Hampshire: Manchester (Burnham); Meredith Neck, Moultonboro (Howe); Intervale, Squam Lake (Allen).

Massachusetts: Sherborn (Babcock); Worcester (Hitchings); Woods Hole (Hagen); Westport (Howe); Wareham (Bangs).

Rhode Island: Tiverton (Howe).



Genus: Neurocordulia Selys.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Neurocordulia obsoleta</i> . . .	+	+		+		
<i>yamaskanensis</i> . . .	+					

97. **Neurocordulia obsoleta** (Say).

Journ. acad. nat. sci. Phila. 8: 28. 1839.
Type locality: "Indiana and Massachusetts."

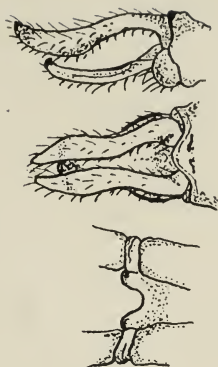
Rare,— streams, lakes, crepuscular.

June 10 to August 30.

Maine: Manchester (Wadsworth).

New Hampshire: Manchester (Burnham);
Meredith Neck (Howe).

Massachusetts: Milton (Hagen); South-
bridge (Bromley); No. Reading (Johnson).



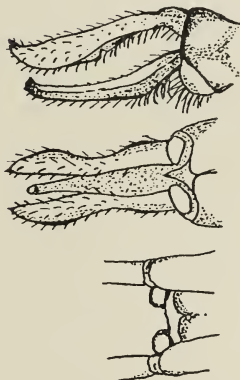
98. **Neurocordulia yamaskanensis**
(Prov.).

Nat. canad. 7: 248. 1875. Type locality:
"St. Hyacinthe," Quebec.

Very rare,—lakes, wholly crepuscular.

June.

Maine: Orono (Harvey).



Genus: *Williamsonia* Davis.

Me. N. H. Vt. Mass. R. I. Conn.

Williamsonia lintneri +

All abdominal segments ringed with yellow.

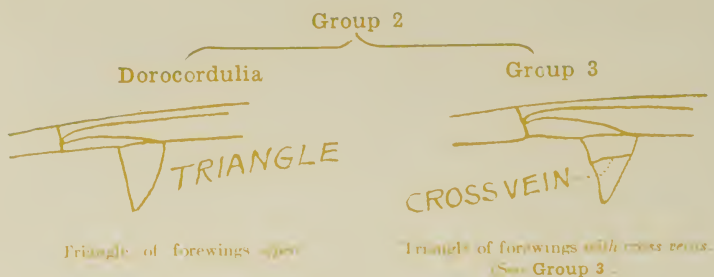
99. **Williamsonia lintneri** (Hagen).

Bull. acad. Belg. ser. 2, 45: 187. 1878. Type locality: "Centre,
N. Y."

Rare,— ponds.

April 30 to June 1.

Massachusetts: Concord (Peirson, Howe); Dedham (Johnson);
Blue Hills (Clench); Sherborn (Smith).



Genus: *Dorocordulia* Needham.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Dorocordulia lepida</i>	+	+		+		+
libera	+	+		+		+

100. *Dorocordulia lepida* (Hagen).

Bull. acad. Belg. **31**: 264. 1871. Type locality: "Massachusetts,"
— New York, Albany,— Maryland,— New Jersey."

Uncommon,— ponds.

May 22 to August 31.

Maine: Greenfield, Orono, Bradley
(Harvey); Manchester (Wadsworth);
Portland (Hagen).

New Hampshire: Manchester (Burnham); White Mts. (Morrison).

Massachusetts: Cambridge, Stow, Natick, Brookline (Hagen);
Sherborn (Babcock); West Bridgewater (Tower); Woods Hole (Kelli-
cott); Concord (Howe); Blue Hills (Johnson); Wareham (Bangs);
Waltham (Bullard); Magnolia, Brookline (Hagen); Newton (Hub-
bard).

Rhode Island: Wickford (Johnson).

Connecticut: Litchfield (Woodruff); Hammond's pond (Hagen).*

*This locality is probably Brookline, Mass., where there is a well known pond
by this name.

101. *Dorocordulia libera* (Selys).

Bull. acad. Belg. **31**: 236. 1871. Type locality: "Canada."

Uncommon,— ponds, lakes.


June 8 to August.

Maine: Greenfield, Orono (Harvey);
Manchester (Wadsworth).

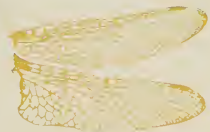
New Hampshire: Franconia (Slosson); Moultonboro (Howe); Jaffrey (Johnson); Peterboro (Cabot).
 Massachusetts: Sutherland (Dwyer); Concord (Howe); West Groton (Lahee).
 Connecticut: Litchfield (Woodruff); Union (Bromley).

Group 3
Group 4

Epicordulia



Wings with brown markings at *base*, *nodus*, and *stigma*.
 Wings of *E. princeps*.



Wings clear, or with brown spot *only* at the *base*.
 (See **Group 4**.)
 The above wings are of *Helocordulia ulteri*.

Genus: Epicordulia Selys.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Epicordulia princeps	+	+	+	+	+	+

102. **Epicordulia princeps** (Hagen).
 Syn. Neur. No. Amer. 134. 1861. Type locality: "Pecos River, Western Texas; Georgia; Maryland."
 Common,— ponds, lakes, uplands.
 May 25 to August 27.
 Maine: Manchester (Wadsworth).
 New Hampshire: Meredith Neck, Moultonboro, Concord (Howe).
 Massachusetts: Cambridge (Cabot); Natick, Sherborn (Babcock); Worcester (Hitchings); Concord (Howe); Fall River (Holt); Cataumet (Winsor); Wellesley (Morse); Webster (Bromley); Wareham (Bangs).
 Rhode Island: Tiverton (Howe).
 Connecticut: New Haven (Hagen); Litchfield (Woodruff); New London (Osburn).

Group 4

Helocordulia



Stigma diamond shaped



Stigma almost rectangular.
(See Group 5).

NOTE: The form of the stigma is sometimes misleading, but an error made here is quickly apparent in following out the characters for the following genera. A cross vein in one of the forewings is sometimes absent, very rarely in both wings. The brown spot at the base of all wings in such unusual cases will serve to distinguish the species from the two foregoing species of *Dorocordulia*.

Genus: *Helocordulia* Needham.

				Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Helocordulia uhleri</i>	.	.	.	+	+		+		+

103. *Helocordulia uhleri* (Selys).

Bull. acad. Belg. ser. 2. 31: 274. 1871. Type locality: "Randal, Maine. . . New Jersey."

Uncommon,—ponds, rivers, upland woodlands.

May 15 to July 12.

Maine: Orono (Harvey); Manchester (Wadsworth); Echo Lake, Mt. Desert Johnson).

New Hampshire: Franconia (Howe).

Massachusetts: Stow (Hagen); West Bridgewater (Tower); Concord (Howe); Fall River (Holt); Amherst (B. S. N. H.).

Connecticut: Litchfield (Woodruff).



Group 5

Somatochlora



Two cubito-anal cross veins in hind wings



One cubito-anal cross vein in hind wings.
(See Group 6).

Genus: Somatochlora Selys.

Me. N. H. Vt. Mass. R. I. Conn.

Somatochlora albicincta . . .	+			
cingulata . . .	+			
elongata . . .	+			
forcipata . . .	+			
franklini . . .	+			
kennedyi . . .	+	+	+	
linearis . . .	+			
minor . . .	+	+		
tenebrosa . . .	+		+	+
walshii . . .	+		+	
williamsoni . . .	+			

A. All segments of abdomen *ringed* with *white*.

1. Abdomen *under* 32-34 mm. long.

104. Somatochlora albicincta
(Burm.).

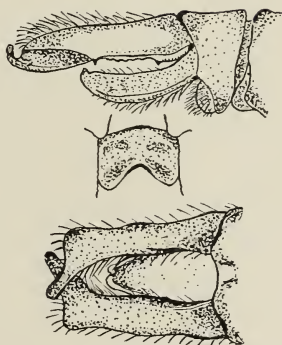
Handb. ent. 2: 847. 1839. Type
locality: "Labrador."

Uncommon,— ponds, lakes.

July 4 to August 11.

New Hampshire: Hermit Lake, Mt.
Washington (Scudder); Waterville
(Hagen); Carter Notch (Allen); Lone-
some Lake, Profile Lake (Howe).

2. Abdomen *over* 40-41 mm.
long.



Side view of male abdominal
appendages. Vulvar of female.
Male abdominal appendages from
above.

105. Somatochlora cingulata
(Selys).

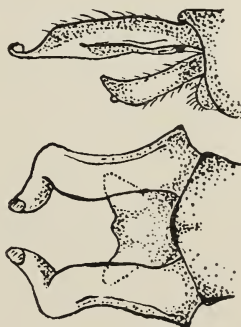
Bull. acad. belg. 31: 302. 1871. Type
locality: "Terre-Neuve."

Rare,— lakes.

New Hampshire: White Mts. (Hagen);
Carter Notch (Allen).

B. *Few* or *no* segments of abdomen
ringed with *white*.

1. Abdomen *over* 40 mm. long.



106. **Somatochlora elongata**
(Scudder).

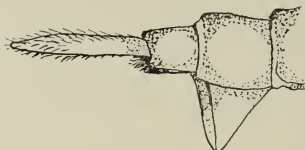
Proc. Bost. soc. nat. hist. 10: 218.
1866. Type locality: "White Mts."

Uncommon,— lakes.

July 8 to August 12.

Maine: at sea off Seoddie point
(Harvey); Bradley (Harvey).

New Hampshire: Fabyan's, Her-
mit Lake, Mt. Washington (Scudder,
Calvert); Franconia (Slosson); Ply-
mouth (Hagen); Centre Harbor, Jackson (Howe); Bretton Woods
(Woodruff).



107. **Somatochlora linearis**
(Hagen).

Syn. Neur. No. Amer. 137. 1861.
Type locality: "St. Louis."

Very rare,— even doubtful.

July 27.

Maine: Manchester (Wadsworth).



108. **Somatochlora williamsoni**
Walker.

Can. Ent. 39: 69. 1907. Type
locality: "Toronto," etc.

Very rare,— lakes.

July 17.

New Hampshire: Meredith Neck
(Howe).



2. Abdomen under 40 mm. long.

109. **Somatochlora forcipata** (Scudder).

Proc. Bost. soc. nat. hist. **10**: 216. 1866. Type locality: "The Glen, White Mts."

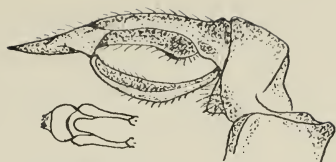
Uncommon,—lakes, ponds.

May to August.

Maine: Orono, Bradley (Harvey); Manchester* (Wadsworth).

New Hampshire: Mt. Washington (Slosson); The Glen, White Mts. (Scudder); Profile Lake (Howe).

* A doubtful record.



110. **Somatochlora kennedyi** Walker.

Can. Ent. **50**: 371. 1918. Type locality: "Orono, Me."

Uncommon,—ponds, lakes, uplands.

June 3 to July 16.

Maine: Orono (Harvey); Manchester (Wadsworth); Capens (Johnson).

New Hampshire: Boscaween (Howe).

Massachusetts: Concord (Howe).



111. **Somatochlora minor** (Calv.).

Ent. News **9**: 87. 1898. Type locality: "Bradley, Maine; Franconia, N. H."

Rare,

June 22 to July 8.

Maine: Bradley (Harvey).

New Hampshire: Franconia (Slosson).



Tip of superior appendages usually less upcurved

Rhode Island: Bristol? (Howe).

Connecticut: Litchfield (Woodruff).

112. **Somatochlora walshii** (Scudder).

Proc. Bost. soc. nat. hist. 10: 217. 1866. Type locality: "The Glen, White Mts."

Rare,— rivers.

June to September 15.

Maine: Orono, Bradley (Harvey);
Manchester (Wadsworth).

New Hampshire: The Glen, White Mts. (Scudder).

Massachusetts: Concord (Howe).

3. Abdomen *variable* 33–47 mm. long.



113. **Somatochlora franklini**
(Selys).*

Bull. acad. Belg. ser. 2. 45: 195. 1878.
Type locality: "Labrador."

Very rare,—

June 18.

Maine: Chemo stream, Orono (Harvey).

* = *Somatochlora septentrionalis* (Hagen).



114. **Somatochlora tenebrosa** (Say).

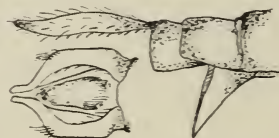
Bull. acad. Belg. ser. 2. 31: 289. 1871.
Type locality: "Indiana."

Uncommon,— brooks.

August 1 to September 8.

New Hampshire: Moat Mt., North
Conway (Calvert); Intervale (Allen).

Massachusetts: Concord (Howe);
Southbridge (Bromley); Wareham (Bangs).



Group 6

Cordulia

Tetragoneuria



First and second antecubital cells of hind wings without dark markings. Third abdominal segment compressed.



First and second antecubital cells of hind wings dark. Third abdominal segment not or but little constricted. (See Tetragoneuria)

Genus: **Cordulia** Leach.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Cordulia shurtleffi</i>	+	+	+	+	+	+

115. ***Cordulia shurtleffi*** Scudder.

Proc. Bost. soc. nat. hist. **10**: 217. 1866. Type locality: "Hermit Lake." Mt. Washington, N. H.

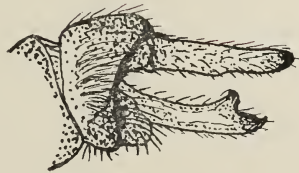
Common,—ponds, lakes.
May 30 to August 11.

Maine: Orono, Bradley (Harvey).

New Hampshire: Hermit Lake, Mt. Washington (Scudder, Calvert); Crawford Notch (Slosson); Moultonboro, Echo Lake (Howe); Intervale (Allen); Peterboro (Cabot).

Massachusetts: Concord, Wayland (Howe); Mt. Greylock (Calvert); Framingham (Frost).

Connecticut: Litchfield (Woodruff).



The forked (side view) lower appendage in the male is diagnostic.

Genus: Tetragoneuria Hagen.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Tetragoneuria canis . . .	+	+				
costalis . . .	+	?				
cynosura . . .	+	+		+		+
cynosura simulans	+	+		+		+
morio . . .		+		+		
spinigera . . .	+	+		+		+

A. Hind wings 24 to 31 mm. long. *Rarely* with brown T-spot on top of frons *clearly* developed. Male abdominal appendages from above *widely divergent*. Female abdominal appendages *not* exceeding 1.7 mm. long.

a. *Brown* of hind wing *not* reaching triangle.

116. Tetragoneuria cynosura (Say).

Journ. acad. nat. sci. Phila. 8: 30. 1839. Type locality: "Massachusetts."

Common, — brooks, ponds, lakes, up-lands.

May 3 to July 9.

Maine: Rangeley, Bradley, Orono (Harvey); Manchester (Wadsworth); Andover (M. C. Z.).

New Hampshire: Meredith Neck (Howe).

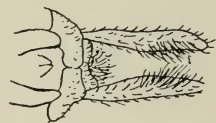
Massachusetts: Everett, Wakefield, Boston (Cabot); Stow, Brookline, Canton (Hagen); Sherborn (Babcock); Worcester (Hitchings); Rutland, Framingham, Auburndale (Johnson); Concord (Howe); Fall River (Holt) Woods Hole (Osburn); No. Saugus (Titus); Green Lodge, So. Natick, Wellesley (Morse); Wollaston (Sprague); Wareham (Bangs); Waverley (Hagen); Newton (Thaxter); Southbridge (Bromley).

Connecticut: Litchfield (Woodruff); New Canaan (Atwater); Danbury (Johnson); New London (Osburn).

b. *Brown* of hind wings reaching to or including triangle.

117. Tetragoneuria cynosura simulans Mutt.

Bull. Wis. nat. hist. soc. 9: 196. 1911. Type locality: "Bluffton Ind."



Side, and view from above of male abdominal appendages. Female vulvar, and abdominal appendages from below.

Uncommon,— ponds, lakes, brooks,
woodlands.

April to July 20.

Maine: Bradley (Harvey); Mt. Desert (Bullock); Manchester (Wadsworth); Echo Lake, Mt. Desert, Calais (Johnston); Andover (M. C. Z.).

New Hampshire: Manchester (Burnham); Meredith Neck, Moultonboro (Howe); Fitzwilliam (Barnes); Jaffrey (Johnson); Squam Lake (Allen); Peterboro (Cabot).

Massachusetts: Worcester (Hitchings); Martha's Vineyard (Moore); Concord (Howe); Blue Hills (Clench); Sherborn (Morse); Southbridge (Bromley); Waltham (Bullard); Wareham (Bangs); Framingham (Johnson); Brookline, Waverley (Hagen).

Connecticut: Litchfield (Woodruff).

NOTE:—*T. c. semiquea* Burm. of Dr. Calvert's list is a southern species whose range is restricted to the south. (See Dr. Muttkowski's paper, Bull. Wis. Nat. Hist. Soc. 9:91-134. 1911 and 13:49-61. 1915).

B. Hind wings 29 to 33 mm. long. *Brown* T-spot on top of frons *always clearly* present. Male abdominal appendages from above but *slightly divergent*.

a. Male superior appendages *without* ventral spine. Female abdominal appendages *over* 1.7 mm., but *under* 2 mm. long.

118. *Tetragoneuria morio* Mutt.

Bull. Wis. nat. hist. soc. 9: 125. 1911. Type locality: "Solon Springs, Douglas Co., Wis."

Rare,— ponds, woodlands.

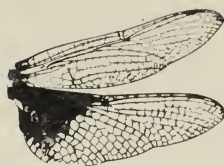
May 18 to June 29.

Maine: (Harvey).

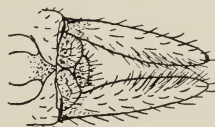
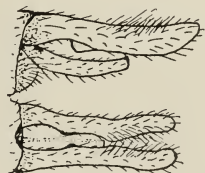
New Hampshire: Meredith Neck (Howe).

Massachusetts: Concord (Howe); Boston, Framingham (Johnson).

b. Male superior abdominal appendages *with* ventral spine. Female abdominal appendages *over* 3 mm. long.



Wings of *T. c. simulans*.



119. **Tetragoneuria spinigera** (Selys).

Bull. acad. Belg. ser. 2. **31**: 269. 1871. Type locality: "Canada."

Uncommon,— ponds, lakes, woodlands.

May 19 to July 14.

Maine: Bradley (Harvey); Manchester (Wadsworth).

New Hampshire: Manchester (Burnham); Peterboro (Cabot); Meredith Neck (Howe); Squam Lake (Allen).

Massachusetts: Winchendon (Morse); Concord (Howe); Groton (Low).

Connecticut: Litchfield (Woodruff).

C. Hind wings 30 to 32 mm. long. Brown T-spot on top of frons never present.

b. Male superior abdominal appendages with tubercle above. Female abdominal appendages only 3 mm. long.



120. **Tetragoneuria canis** MacLach.

Ent. Mo. Mag. **23**: 104. 1886. Type locality: "Washington Territory."

Very rare,— ponds.

June 18.

New Hampshire: Jaffrey (Johnson); Franconia (Slosson).



121?. **Tetragoneuria costalis** Selys.

Bull. acad. Belg. ser. 2. **31**: 273. 1871. Type locality: "Georgie americaine."

One record.

June 9, 1898.

Maine: Manchester (Wadsworth in U. S. N. M.).

NOTE: *T. costalis* is of doubtful status as a species, and the record of *T. spinosa* from Franconia, N. H., of Dr. Calvert and most authors should be referred to *T. canis* (see Dr. Muttkowski's paper). *T. spinosa* is a southern species and very distinct.

Additional Stations

PART I

Agrion amatum

June 8

Agrion aequabile

Vermont: Brandon, Leicester (Dutton).

Agrion maculatum

Vermont: Bristol (Dutton).

Massachusetts: Wareham (Bangs); Groton (Low).

Lestes congener

Massachusetts: Weston (M. C. Z.).

Rhode Island: Bristol (Howe).

Lestes eurinus

Massachusetts: Wareham (Bangs).

Lestes unguiculatus

September 6

Massachusetts: Wareham (Bangs).

Vermont: So. Hero, Grand Isle (Morse).

Lestes uncatus

Vermont: So. Hero (Morse).

PART II

Lestes disjunctus

Vermont: Woodstock (Morse).

Massachusetts: Wellesley (Morse).

Lestes rectangularis

Massachusetts: Wareham (Bangs).

Lestes vigilax

Massachusetts: Lynnfield (Little).

Lestes inequalis

September 19

Massachusetts: Heath (Warden); Wareham (Bangs).

Argia moesta

Massachusetts: Wellesley (Morse).

Argia violacea

Massachusetts: Sherborn, Wellesley (Morse); West Peabody (Little).

Enallagma durum

June

Massachusetts: Wareham (Bangs).

Enallagma calverti

May 12

Enallagma ebrium

Vermont: So. Hero, Woodstock (Morse); Bristol (Dutton).

Massachusetts: Wakefield (Atwater); Lynnfield (Little).

Enallagma traviatum

July 8

Massachusetts: Wareham (Bangs).

Enallagma aspersus

September 6

Rhode Island: Bristol (Howe).

Enallagma civile

September 22

Lynnfield (Little).

Enallagma pictum

July 8

Massachusetts: Wareham (Bangs).

Enallagma geminatum

October 2

Enallagma signatum

Massachusetts: Wareham (Bangs).

Enallagma pollutum

Massachusetts: Wakefield (Atwater).

Nehalennia irene

Vermont: So. Hero, Woodstock (Morse).

Massachusetts: Wakefield (Atwater).

Amphiagrion saucium

July 29.

Vermont: Bristol (Dutton).

Massachusetts: Wareham (Bangs).

Chromagrion conditum

Vermont: Bristol (Dutton).

Ischnura verticalis

Vermont: So. Hero, Woodstock (Morse); Bristol (Dutton).

Massachusetts: Wakefield (Atwater); Wareham (Bangs).

Ischnura posita

September 18

Massachusetts: Wakefield (Atwater).

Anomalagrion hastatum

Massachusetts: Wareham (Bangs).

PART III

Cordulegaster diastatops

Massachusetts: Wareham (Bangs).

Connecticut: (Norton).

Ophiogomphus rupinsulensis

New Hampshire: Franconia (Slosson).

Ophiogomphus aspersus

Vermont: Brandon (Dutton).

Gomphus albistylus

Massachusetts: Wellesley (Morse).

Gomphus abbreviatus

New Hampshire: Franconia (Slosson).

Gomphus brevis

Vermont: Brandon (Dutton).

Gomphus exilis

New Hampshire: Squam lake (Allen).

Vermont: Bristol (Dutton).

Massachusetts: Mt. Wachusett (Sprague).

Gomphus furcifer

Massachusetts: Bedford (Henshaw).

Gomphus spiniceps

June

Hagenius brevistylus

Massachusetts: Wareham (Bangs).

Recapitulation of New England Aeschnidae and Libellulidae
(Cordulinae)

	Tachypteryx	Cordulegaster	Progomphus	Hagenius	Ophiogomphus	Gomphus	Dromogomphus	Boyeria	Basiaeschna	Gomphateschna	Awa x	Aeshna	Nasiaeschna	Epiaeschna	Didymops	Mucronia	Neurocordulia	Williamsonia	Dorocordulia	Epicordulia	Helocordulia	Sonotrichora	Cordulia	Tetraneurina
Me.	3	1	7	7	1	1	1	1	1	1	8		1	1	1	2			2	1	1	7	1	5 = 53
N. H.	2	1	5	10	1	1	1	1	1	1	9	1	1	1	1	1			2	1	1	9	1	5 = 57
Vt.	2		1	2				1	1	1	1	6			1					1				= 17
Mass.	1	3	1	1	1	15	1	2	1	1	2	9		1	1	1	1	1	2	1	1	3	1	4 = 55
R. I.					1						1	3		1		1				1	1			= 9
Conn.	3		1	2	6	1	1	1	1		1	6		1	1				2	1	1	1	1	3 = 33



Memoir of the Thoreau Museum of Natural History: II

Manual of the Odonata of New England

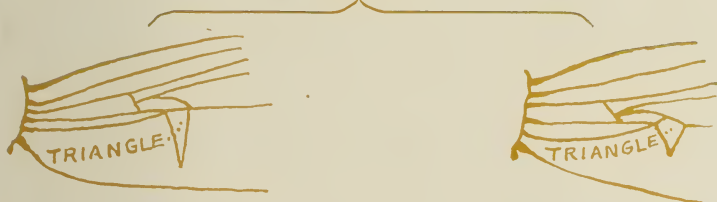
By R. HEBER HOWE, Jr.

PART V.

January 8, 1920.

Subfamily: Libellulinae Selys.

Group 1



Triangle of fore-wings typical,—
three sided.

Triangle of fore-wings atypical,
four sided (See *Nannothemis*).



Stigma with end veins parallel.

Stigma with end veins not parallel. (See
Group 8—*Tramea* and *Pantala*.)

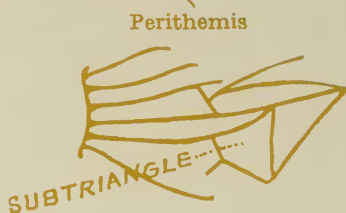


Sectors of the arcus in fore-wings *contiguous*, but *not completely fused* beyond the arculus.

Sectors of arcus in fore-wings *fused* for short distance (2–3 mm.) beyond the arculus (See Group 6).



Subtriangle (internal) of fore-wing
with three to eleven cells.



Subtriangle (internal) of fore-wings open
(See **Perithemis**).

Libellula



Male with *no* ventral hooks on
segment 1 of abdomen.

Plathemis



Male with pair of ventral hooks
on segment 1 of abdomen.



Female with tibia of third leg
longer than its femur.



Female with tibia of third leg
only as long as its femur
(See **Plathemis**).

Genus: Libellula Linne

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Libellula auripennis</i>				+	+	+
<i>cyanea</i>		+		+		
<i>exusta</i>	+	+	+	+		+
<i>flavida</i>				+		
<i>incesta</i>	+	+		+	+	+
<i>luctuosa</i>			+	+	+	+
<i>pulchella</i>	+	+	+	+	+	+
<i>quadrimaculata</i>	+	+	+	+		+
<i>semifasciata</i>	+	+		+	+	+
<i>vibrans</i>				+		+

A. Wings *unspotted*, suffused with *gold*, stigma *orange*.

122. **Libellula auripennis** Burm.

Handb. ent. 2: 861. 1839. Type locality: "Savannah".

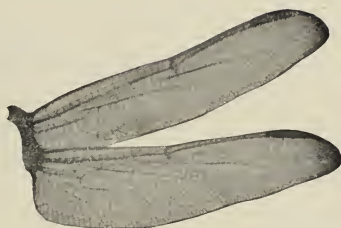
Common,— ponds, lakes,— maritime.

July 4 to August 28.

Massachusetts: Provincetown (Sanborn); Woods Hole, Cuttyhunk (Calvert); Martha's Vineyard (Moore); Nonamesset Island (Osburn); South Orleans, Nantucket (Howe); West Chop (Morse); Wareham (Bangs); Boston (Morrison).

Rhode Island: Watch Hill, Block Island (Calvert); Middletown (Howe).

Connecticut: Niantic (Morse); Fairfield Co., (Benedict); New London (Osburn).



Wings (nat. size).

B. Wings *clear*, stigma *unicolored*, *black*.

(female wings slightly clouded at tips).

123. **Libellula incesta** Hagen.

Syn. neur. 155. 1861. Type locality: "Carolina."

Common,— ponds, lakes.

June 6 to September 17.

Maine: Manchester (Wadsworth).

New Hampshire: Manchester (Burnham); Meredith (Calvert).

Massachusetts: Saugus, Milton (Hagen); Sherborn (Babcock); Worcester (Hitchings); West Bridgewater (Tower); Wellesley, Dover, Medfield (Morse); Concord, South Orleans (Howe); Holland (Bromley); Wareham (Bangs); Sharon (Atwater); Framingham (Warden); Bedford (Swett); Brookline (Minot); South-bridge, Webster (Bromley); Woods Hole (Osburn).

Rhode Island: Washington (Johnson).

Connecticut: Danbury (Johnson).

C. Wings with *small dark streak* at base, and wing *tip brownish*.

a. stigma *unicolored*,— *black*.



124. **Libellula vibrans** Fabr.

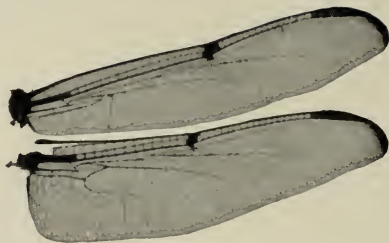
Syst. ent. 424. 1775. Type locality: "America."

Rare,—

July

Massachusetts: Woods
Hole (Kellicott, Benedict, Os-
burn); Fall River (Holt).

Connecticut: Sa chem
Head (Calvert).



b. stigma, *bicolored*—*black* and *yellow*.

1. Proximal *three fourths* of stigma *yellow*.

Libellula flava Ramb.

Neur. 58. 1842. Type locality: not given.

Rare,—ponds.

June 24 to August 7.

Massachusetts: Concord (Howe); Wareham (Bangs).

NOTE: The determination of the specimen from Concord recorded above was made by Mr. Williamson. From the series of specimens from Wareham, Mass., collected by Mr. O. Bangs and now in the Museum of Comparative Zoölogy in Cambridge, Mass., Mr. Banks and I were able to select two males and three females *larger* than the others, with *four* cells in the interior triangle (should be five) of the fore wings, and with *three fourths* of the stigma yellow. These specimens represent *flava* of Rambur as distinguished by Dr. P. P. Calvert. The remaining *smaller* specimens, three males and two females, have only the typical *three* cells in the internal triangle, and *one half* the stigma yellow. It seems evident that *flava* represents simply a variation in *cyanea*, a variation that occurs in individuals, and one that is duplicated in extent in many other species not recognized by name.

2. Proximal *half* of stigma *yellow*.

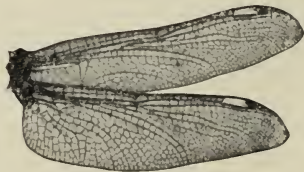
125. **Libellula cyanea** Fabr.

Syst. ent. 424. 1775. Type locality:
"America."

Uncommon,—ponds.

May 24 to September 4.

New Hampshire: Manchester
(Burnham).



Massachusetts: Beverley, Woburn, Cambridge, Natick, Milton (Hagen); Worcester (Hitchings); West Bridgewater (Tower); Woods Hole (Kellicott); Fall River (Holt); Wellesley, Winchendon (Morse); Concord (Howe); Southbridge (Bromley); Sharon (Atwater); Boston (Parshley); Bedford (Swett); Winchendon (Russell); Groton (Low); Sherborn (Babcock); Tyngsboro (M. C. Z.); Arlington (Bullard).

D. Wings with *small dark spot at base, and wing tips clear.*

Stigma *unicolored*,—*black.*

126. *Libellula exusta* Say.

Journ. acad. nat. sci. Phila. 8: 29 1839. Type locality: "Massachusetts."

Common,—ponds, lakes.

May 19 to July 28.

Maine: Bradley, Westbrook (Harvey); Manchester (Wadsworth); Norway (Hagen).

New Hampshire: Franconia (Slosson, Howe); Manchester (Burnham); Intervale, Squam Lake (Allen); Moultonboro, Meredith Neck (Howe); Peterboro (Cabot).

Vermont: Brandon, Bristol (Dutton).

Massachusetts: Cambridge, Worcester, Sutton (Hagen, Hitchings); Fall River (Holt); Blue Hills (Clench); Winchendon, Sherborn, Wellesley (Morse); Webster (Bromley); Concord, Chatham, Belmont (Howe); Framingham (Johnson, Frost); Winchendon (Russell); Groton (Low); West Chop (Scudder); West Roxbury (Scudder); Malden (Henshaw); Woods Hole (Osburn).

Rhode Island: Washington (Johnson).

Connecticut: New Haven (Walden); Litchfield (Woodruff); New London (Osburn).

Note: *Libellula exusta* var. *julia* (Uhler). Now recognized by Ris as a valid variety, but until the New England status is better known its inclusion in this list will be postponed. *L. exusta* is said *never* to have the thoracic dorsum pruinose but *all* the basal segments so, while in the variety *julia* the dorsum of the thorax is *entirely pruinose*, but *only the first few* basal segments of the abdomen. In *exusta* the black basal marking on the hind wing *includes* at least a *part* of the triangle; in *julia* it *never* extends to it. Under this separation I have the following stations for *julia*: Moultonboro, Franconia, and Meredith, N. H.; Brandon and Bristol, Vt.; Concord, Winchendon, and Framingham, Mass.

E. Wings with *large dark basal* marking covering *one third* of wings.



127. *Libellula luctuosa* Burm.*

Handb. ent. 2: 861. 1839. Type locality: "Pennsylvanien."

* = *Libellula basalis* of earlier writers.

Uncommon,—ponds.

June 16 to September 6.

Vermont: Brandon, Leicester (Dutton).

Massachusetts: Concord Brookline, Milton (Howe); West Peabody (Little); Stockbridge (Calvert); Blue Hills (Clench); Wellesley (Morse); Southbridge (Bromley); Bedford (Swett); New Lenox, Mt. Tom (Johnson); Brookline (Maxey); Woods Hole (Osburn).

Rhode Island: Wickford (Atwater); Bristol (Howe).

Connecticut: Litchfield (Woodruff); Fairfield Co. (Benedict); New London (Osburn).

F. Wings with *black triangular spot at base*, and *dot at nodus*. Front margin suffused with *yellow*.



128. *Libellula quadrimaculata* Linn.

Syst. nat. 1: 543. 1778. Type locality: "Europa."

Common,—ponds, lakes.

May 19 to August 15.

Maine: Rangeley, Orono, Bradley (Harvey); Mt. Desert (Bullock); Manchester (Wadsworth); So. West Harbor (Johnson).

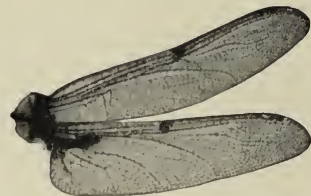
New Hampshire: Franconia (Slosson, Howe); Manchester (Burnham); Meredith Neck, Moultonboro, Lisbon, Lyman, Centre Harbor (Howe); Intervale (Allen); Jaffrey (Johnson).

Vermont: Brandon (Dutton).

Massachusetts: Stow (Hagen); Worcester (Hitchings); Concord (Howe); Green Lodge, Woods Hole (Morse, Osburn); Brookline, Manomet (Johnson); Framingham (Frost); Wareham (Bangs); Southbridge (Bromley).

Connecticut: Sachem Head (Calvert); New Canaan (Atwater); New London (Osburn).

G. Wings with a *dark streak at base*, a *dark spot at nodus*, and a *dark band across the tip*. Front margin suffused with *yellow*.



129. **Libellula semifasciata** Burm.

Handb. ent. 2: 862. 1839. Type locality: "Nord-Amerika."

Uncommon,— ponds.

June 2 to August 16.

Maine: Orono, Bradley, Greenfield (Harvey); Manchester (Wadsworth); Kennebunkport (Woodruff).

New Hampshire: Manchester (Burnham).

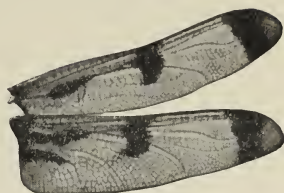
Massachusetts: Manchester, Cambridge, Stow (Hagen); Woods Hole (Calvert Osburn); Fall River (Holt); Blue Hills (Clench); Concord, Chatham (Howe); Provincetown (Benedict); Dedham, Dover, Green Lodge (Morse); Brookline (Johnson); Martha's Vineyard (Cushman); Wareham (Bangs); Groton (Low); Wollaston (Sprague).

Rhode Island: Bristol (Howe); Buttonwoods (Johnson).

Connecticut: Sachem Head (Calvert); Darien (Johnson); New London (Osburn).

H. Wings with *three large dark bands at base, nodus, and near tip*, in male with *milk white spots* between.

NOTE: The females are apt to be confused with the following species, but the wings in this species are *over 41 mm. long*, in the next *under 33.5 mm. long*.



130. **Libellula pulchella** Drury.

Ill. nat. hist. 1: 115. 1770.

Type locality: "New York."

Common,— ponds, lakes,
and meadow lands.

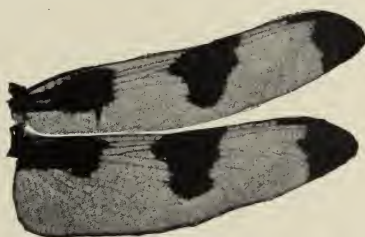
June 5 to September 8.

Maine: Orono, Bradley, Auburn, Fryeburg, Westbrook (Harvey); Andover, Brunswick (Hagen); Manchester (Wadsworth).

New Hampshire: Franconia (Slosson); Manchester (Burnham); Centre Harbor, Meredith Neck, Moultonboro, Lisbon, Lyman (Howe); Intervale (Allen); Jaffrey (Johnson).

Vermont: Brandon (Dutton).

Massachusetts: Milton (Hagen); Worcester (Hitchings); Woods Hole, Cuttyhunk, Stockbridge (Calvert); Nantucket, Concord, Brookline, Belmont, Chatham, Orleans, Brewster (Howe); Blue Hills (Clench);



Fall River (Holt); No. Saugus (Titus); Wellesley, Sherborn (Morse); Southbridge (Bromley); Framingham (Warden); Heath (Parker); New Lenox (Johnson); Wareham (Bangs); Wakefield (Atwater); Cambridge (Osterberg); Arlington, Waltham (Bullard); Wollaston (Sprague); Beverley (Burgess); Forest Hills (Henshaw); Woods Hole (Osburn).

Rhode Island: Providence (Davis); Block Island (Calvert); Tiverton, Middletown (Howe); Bristol (Parker, Clark, Howe); Wickford (Atwater).

Connecticut: Litchfield (Woodruff); Watertown, Burchard's Pond, Fairfield Co. (Benedict); Stanford (Morse); Lyme (Brown); Danbury (Johnson); New London (Osburn); Union (Bromley).

Genus: *Plathemis* Hagen.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Plathemis lydia</i>	+	+	+	+	+	+

131. *Plathemis lydia* (Drury).

Ill. nat. hist. 1: 112. 1770. Type locality: "Virginia."

Common,— brooks, streams, rivers, ponds, lakes.

May 27 to September 19.

Maine: Orono, Bradley (Harvey); Manchester (Wadsworth); Mt. Desert (Bullock); Bar Harbor (Johnson); Brunswick, Bethel (M. C. Z.).

New Hampshire: Centre Harbor (Howe); Intervale, Squam Lake (Allen); Franconia (Slosson); Manchester (Burnham).

Vermont: Brandon (Dutton).

Massachusetts: Cambridge (Hagen, Atwater); Worcester (Hitchings); Woods Hole, Stockbridge (Calvert); Hingham (Barnes); Cuttyhunk (Ufford); Concord, Brookline, Chatham (Howe); Blue Hills (Clench); No. Saugus (Titus); Southbridge (Bromley); Fall River (Holt); Framingham (Warden); Brookline (Johnson); Wareham (Bangs); Groton (Low); Andover (Seudder); Woods Hole (Osburn); Great Barrington (Johnson).



Wings of male.



Wings of female.

Rhode Island: Bristol, Middletown, Tiverton (Howe); Block Island (Calvert); Wickford (Atwater).

Connecticut: Hartford (?); Litchfield (Woodruff); New Canaan (Atwater); No. Guilford (Howe); Darien, Watertown, Burchard's Pond, Fairfield Co. (Benedict); Union (Bromley); New London (Osburn).

Genus: Perithemis Hagen.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Perithemis domitia tenera. . .				+	+	+

132. **Perithemis domitia tenera** (Say).

Journ. acad. nat. sci. Phila. 8:
31. 1839. Type locality: "Indiana,
Pennsylvania, and Massachu-
setts."

Uncommon,—ponds.

June 12 to September 5.



Wings of male
(orange).



Wings of
female.

Massachusetts: Milton (Hagen); Sherborn (Morse, Babcock); Worcester (Hitchings); Fall River (Holt); West Peabody (Little); Concord, Cambridge, South Orleans (Howe); Blue Hills (Clench); Waltham, Wellesley (Morse); Southbridge (Bromley); Sharon, Fall River (Atwater); Bridgewater (Cushman); Swansea (Easton); Bedford (Swett); Brookline (Johnson); Sherborn (Smith); Natick (Stratton); Wareham (Bangs); Holland (Bromley); Woods Hole (Osburn).

Rhode Island: Providence (Davis); Wickford (Atwater); Buttonwoods (Johnson).

Connecticut: Litchfield (Woodruff); Bethlehem, Darien, Burchard's Pond, Fairfield Co. (Benedict); New London (Osburn).

Genus: Nannothemis Brauer.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Nannothemis bella	+	+		+		+

133. **Nannothemis bella** (Uhler.).

Proc. acad. nat. sci. Phila. 87. 1857. Type locality: "Baltimore."

Uncommon,—bogs, ponds.

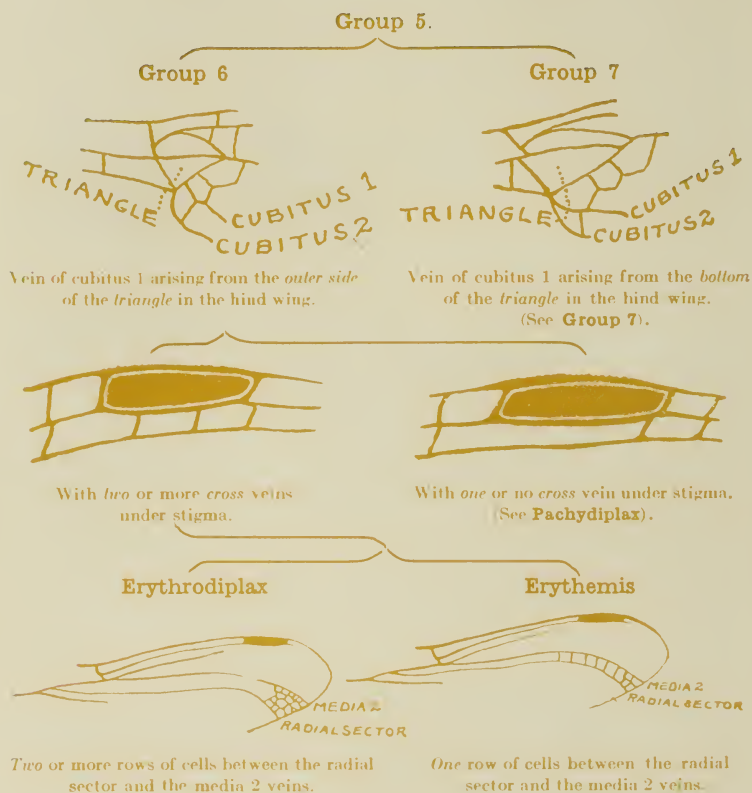
June 17 to July 29.

Maine: Mt. Desert (Bullock); Manchester (Wadsworth).

New Hampshire: Manchester (Burnham); West Swansea (?); No. Conway (Allen); Lyman (Howe).

Massachusetts: Wellesley, Dedham (Morse); (Acad. Nat. Sci., Phila.); Fall River (Holt); Wareham (Bangs); Brewster (Howe); Bridgewater (Cushman); Brookline (Bowditch); Newtonville (Thaxter).

Connecticut: (Hagen).



Genus: Erythrodiplax Brauer.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Erythrodiplax berenice . . .				+	+	+

134. **Erythrodiplax berenice** (Drury).

Ill. nat. hist. 1: 114. 1770. Type locality: "Virginia, New York, and Maryland."

Common,—maritime salt marshes.

June 21 to August 14.

Massachusetts: Milton (Hagen); Woods Hole (Calvert, Osburn); Cataumet (Winsor); Nantucket, Chatham, South Chatham, Cotuit (Howe); Hingham (Barnes); Fall River (Holt); So. Dartmouth (Hunt); Faneuil (Morse); Horse Neck Beach, Edgartown, Boston, Eastham (Johnson); Wareham (Bangs); Chelsea Beach (M. C. Z.); Wollaston (Sprague); Revere (M. C. Z.).

Rhode Island: Barrington (Easton).

Connecticut: Niantic, Stamford (Morse); Sachem Head (Calvert); Rowayton (Johnson); Burchard's Pond, Butler's Island, Darien, Fairfield Co. (Benedict); New London (Osburn).

Genus: *Erythemis* Hagen.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Erythemis simplicicollis</i> . . .		+		+	+	+

135. **Erythemis simplicicollis** (Say).

Journ. acad. nat. sci. Phila. 8: 28. 1839. Type locality: "Indiana and Massachusetts."

Common,—ponds and rivers.

June 27 to September 6.

New Hampshire: Manchester (Burnham).

Massachusetts: Natick (Hagen); Worcester (Hitchings); Braintree (Sprague); Woods Hole, Cuttyhunk (Calvert); Concord, Nantucket (Howe); West Peabody (Little); Fall River (Holt); Wellesley (Morse); Provincetown (U. S. N. M., Morse); Framingham (Warden); Bedford (Swett); Forest Hills (Henshaw); Eastham, Auburndale (Johnson); Wareham (Bangs); Newton, Tuckernuck Island (M. C. Z.); Malden (Sprague); Brookline (Scudder); Woods Hole (Osburn); Braintree (Sprague).

Rhode Island: Bristol (Howe); Block Island (Calvert).

Connecticut: Darien, Burchard's Pond, Fairfield Co. (Benedict); Sachem Head (Calvert); Bethlehem (Johnson); New London (Osburn).

Genus: *Pachydiplax* Brauer.

Me. N. H. Vt. Mass. R. I. Conn.
Pachydiplax longipennis . . . + + +

136. ***Pachydiplax longipennis*** (Burm.).

Handb. ent. 2: 850. 1839. Type locality: "Mexico."

Common,—ponds and rivers.

June 7 to September 9.

Massachusetts: Natick (Hagen); Worcester (Hitchings); West Bridgewater (Tower); Fall River (Holt); West Peabody (Little); Concord, Orleans (Howe); Provincetown, Woods Hole (Benedict, Osburn); Blue Hills, Wellesley (Morse); Sharon (Atwater); Bedford (Swett); Martha's Vineyard (Cushman); Wareham (Bangs); Newton (M. C. Z.); Wollaston (Sprague); Boston (Allen).

Rhode Island: Providence (Davis); Block Island (Allen, Calvert).

Connecticut; Sachem Head (Calvert); Fairfield Co. (Benedict); Darien (Johnson).

Group 7



Wings clear or faintly suffused with yellow



Wings dark spotted (See *Celithemis*).

Sympetrum



Stigma thrice as long as wide.

Leucorrhinia



Stigma thrice as long as wide.

Genus: *Sympetrum* Newman.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Sympetrum</i> <i>ambiguum</i> . . .				+		
<i>costiferum</i> . . .	+	+		+	+	+
<i>obtrusum</i> . . .	+	+		+	+	
<i>rubicundulum</i> . .	+	+	+	+	+	+
<i>scoticum</i> . . .			+			
<i>semicinctum</i> . .	+	+	+	+	+	+
<i>vicinum</i> . . .	+	+		+	+	+

A. Legs *black*.

a. Wings *clear*.

1. Wings *over* 25 mm. long.

137. *Sympetrum rubicundulum* (Say).

Journ.
acad. nat.
sci. Phila. 8:
26. 1839.
Type local-
ity: "Indi-
ana and
Massachusetts."



Female vulvar
lamina.



Male abdominal appendages.
Side view.



Male genital hamule.
Side view.

Abundant,—ponds, lakes.

June 9 to October 9.

Maine: No. West Carry, Mt. Kineo, Rangeley, So. Lagrauge, Greenfield, Bradley, Orono, Fryeburg (Harvey); Manchester (Wadsworth); York Harbor (Moore); Echo Lake, Mt. Desert (Johnson).

New Hampshire: Mt. Washington, Hermit Lake, Fabian's, North Conway (Hagen, Calvert); Franconia (Slosson); Manchester (Burnham); Meredith Neck, Centre Harbor, Moultonboro, Profile Lake, Lisbon, Lyman (Howe); Intervale, North Conway (Allen); Kingston (Morse); Bethel (Uhler).

Vermont: Newport (Morse); Brandon, Leicester (Dutton); So. Hero (Morse); Rutland (Johnson)

Massachusetts: Worcester (Hitchings); Woods Hole, Cuttyhunk, Mt. Greylock (Calvert); Nantucket (Cockerell, Howe); Concord, (Howe); Kingston (Warden); Hingham (Barnes); West Peabody, Lynnfield (Little); Orleans (Parker); Fall River (Holt); Cotuit (Peirson); Melrose, Highlands (Clemens); Provincetown (Morse, Benedict); No. Saugus (Gowdy); West Chop, Dover, Sherborn, Wellesley (Morse);

Southbridge (Bromley); Nonquitt (Baldwin); Sharon, Wakefield (Atwater); Framingham (Warden); Edgartown, Auburndale (Johnson); Bridgewater (Cushman); Winchendon (B. S. N. H.); New Bedford (Holcomb); Wareham (Bangs); Natick (M. C. Z.); Brookline (Henshaw); Woods Hole (Osburn).

Rhode Island: Providence (Davis); Block Island (Calvert); Bristol, Middletown (Howe); Wickford (Atwater); Bristol (Clark).

Connecticut: Litchfield (Woodruff); New Canaan (Atwater); Sachem Head (Calvert); Bethlehem (Benedict); Stamford, Deep River, Canaan (Morse); Union (Bromley); New London (Osburn); Lakeville (Calvert).

138. *Sympetrum obtusum* (Hagen).

Stett. ent.
zeit. 28: 95.
1867. Type
locality: "Chi-
cago."



Uncommon,— ponds, lakes.

July 3 to October 5.

Maine: King & Bartlett (Laurent); Fryeburg (Harvey); York Harbor (Moore); Mt. Katahdin (U. S. N. M.).

New Hampshire: Fabyan's (Calvert); Meredith Neck, Centre Harbor, Lisbon (Howe); Intervale, North Conway (Allen); Franconia (Slosson).

Massachusetts: Concord, Chatham (Howe); West Peabody (Little); Nonquitt (Baldwin); (Hagen).

Rhode Island: Bristol (Howe).

2. Wings *under* 23 mm. long

139. *Sympetrum scoticum* (Donovan).

Brit. ins. 15: 523.
1811. Type locality:
"bogs of Scotland."



One record,—

New Hampshire: Franconia (Slosson).

b. Wings with *basal half yellow*, palest next the body.

1. Wings *over* 25 mm. long.

140. **Sympetrum semicinctum** (Say).

Journ.
acad.nat.sci.
Phila. 27.
1839. Type
locality: "In-
diana and Massachusetts."



Common,— brooks, ponds.

July 25 to October 5.

Maine: Orono, Bradley (Harvey); Manchester (Wadsworth); York Harbor (Moore); Ashland Junction (Johnson).

New Hampshire: White Mts. (Hagen); Franconia (Slosson, Howe); Manchester (Burnham); Intervale (Allen); North Conway (Holt, Morse); Fabyan's (Calvert); Lyman (Howe).

Vermont: Brandon (Dutton).

Massachusetts: Milton (Hagen); Worcester (Hitchings); Fall River (Holt); Concord (Howe); Sherborn, Wellesley (Morse); Southbridge (Bromley); Sherborn (Smith); Manomet (Cushman); Framingham (Warden); Wareham (Bangs); Lynnfield (Little); Minot, Saugus (M. C. Z.).

Rhode Island: Wickford (Atwater)

Connecticut: Montville, No. Haven (Morse); New London (Osborn).

c. Wings with *front margin yellow*, 27 mm. long.

141. **Sympetrum costiferum** (Hagen).

Syn. Neur.
No. Amer. 175.
1861. Type lo-
cality: "Mass-
achusetts;
New York."



Common,— ponds, lakes and lagoons.

July 12 to October 7.

Maine: Orono, Bradley (Harvey); Manchester (Wadsworth); York Harbor (Moore); Bar Harbor (Johnson).

New Hampshire: Franconia (Slosson, Howe); Intervale, North Conway (Allen); Whitefield (Howe).

Massachusetts: Worcester (Hitchings); Fall River, Pocasset,

Manomet (Holt); Cuttyhunk (Ufford); Nonamesset Island (Osburn); Provincetown (Benedict); Concord, Nantucket (Howe); Sharon, Fall River (Atwater); Bridgewater, Martha's Vineyard (Cushman); New Bedford (Holcomb); Wareham (Bangs); Lynnfield, West Peabody (Little); Tuckerman Island (M. C. Z.); Wellfleet (M. C. Z.); Brookline (Bowditch); Woods Hole (Calvert).

Rhode Island: Weekapaug (U. S. N. M.); Tiverton (Easton); Watch Hill, Block Island (Calvert).

Connecticut: Litchfield (Woodruff); Bethlehem (Benedict); New London (Osburn).

B. Legs *greenish yellow*.

a. Wings 21–26 mm. long.

142. *Sympetrum vicinum* (Hagen).

Syn. Neur. No. Amer. 175. 1861. Type locality: "Bergen Hill, New Jersey; Pennsylvania; Washington."

Common,— brooks, ponds, lakes.

(June 24) August to November 8.

Maine: Orono, Bradley, Fryeburg, Ktaadn Iron Works (Harvey); Man-

chester (Wadsworth); Brunswick (Hagen); York Harbor (Moore); Mt. Katahdin (U. S. N. M.).

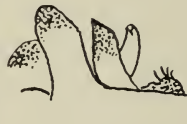
New Hampshire: Franconia (Slosson); Fabyan's (Calvert); Meredith Neck, Jackson, Little Lake Sunapee (Howe); Intervale (Allen); Kingston (Morse); Manchester (Burnham).

Massachusetts: Milton (Hagen); Fall River, Westport (Holt); West Peabody (Little); Hingham (Barnes); Blue Hills (Clench); Brookline (Galbraith); Woods Hole (Benedict); Sherborn, Wellesley (Morse); Framingham (Warden); Concord, Chatham (Howe); Sharon (Atwater); Rutland (Johnson); Bridgewater (Cushman); Manomet (Brooks); Wareham (Bangs); Cambridge (Atwater); Natick (M. C. Z.); Arlington (Bullard); Provincetown, Nantucket (Calvert).

Rhode Island: Providence (Davis); Wickford (Atwater); Bristol (Howe).

Connecticut: Litchfield (Woodruff); Bethlehem (Benedict); New London (Osburn).

b. Wings *over* 25 mm. long.



143. **Sympetrum ambiguum** (Ramb.)*

Ins. Neur. 106. 1842. Type locality: not given.

One record,—

June 20, 1821.

Massachusetts: Milton (Hagen)

Genus: *Leucorrhinia* Brittinger.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Leucorrhinia frigida</i>	+	+	+	+		+
<i>glacialis</i>		+		+		
<i>hudsonica</i>	+	+		+		
<i>intacta</i>	+	+	+	+	+	+
<i>proxima</i>	+	+		+		

A. Male with *yellow triangular spot* on 7th. segment of abdomen in *adults*.

a. ♂ with abdominal segments 4-6 black, in both sexes stigma *dark brown*.

1. Under lip black with *sides white*.

144. ***Leucorrhinia intacta*** (Hagen).

Syn. Neur. No. Amer. 179.

1869. Type locality: "Wisconsin; Chicago; Ohio; Massachusetts."



Common, — *b r o o k s*,
ponds, lakes.

Male abdominal appendages. Side view.

Male genital hamule. Side view.

May 17 to August 3.

Maine: Orono, Bradley, Westbrook (Harvey); Manchester (Wadsworth); So. West Harbor (Johnson); Bar Harbor (Johnson).

New Hampshire: Mt. Washington (Slosson); Franconia (Slosson, Howe); Manchester (Burnham); Meredith Neck, Moultonboro, Franconia, Lyman, Center Harbor (Howe); Intervale (Allen); Peterboro (Cabot); Meredith (Calvert).

Vermont: Brandon (Dutton).

Massachusetts: (Hagen); Nantucket, Concord, Belmont, Chatham (Howe); Fall River (Holt); Mt. Greylock, Stockbridge (Calvert); Cotuit (Pierson); Woods Hole (Benedict, Osburn); Melrose Highlands (Clemens); Green Lodge, Sherborn, Natick, Winchendon (Morse); Southbridge (Bromley); Framingham (Warden, Frost); North Reading, Dedham (Johnson); Wareham (Bangs); Newtonville (Thaxter); Natick, Tyngsboro, Provincetown, Magnolia (M. C. Z.); Boston, Revere (Scudder); Belmont (Bullard); Wollaston (Sprague).

* Given in recent lists as *S. albifrons*.

Rhode Island: Bristol (Johnson, Howe); Wickford (Johnson).

Connecticut: Litchfield (Woodruff); Sachem Head (Calvert); Darien (Johnson); New London (Osburn).

b. ♂ with abdominal segments 4-7 with *wedge shape red spots*, in both sexes stigma *dull red*.

145. **Leucorrhinia hudsonica** (Selys).

Rev. odon. Eur. 53. 1850. Type locality: "Le nouveau Brunswick, pres de la Baie d'Hudson."

Rare,—bog margined ponds and lakes.

May 30 to July 15.

Maine: Oldtown, Orono (Harvey); Capens (Johnson).

New Hampshire: Mt. Washington, Franconia (Slosson).

Massachusetts: (Hagen); Winchendon (Russell).

B. Male with segments 4-10 *black*.

a. Under lip *entirely black*.

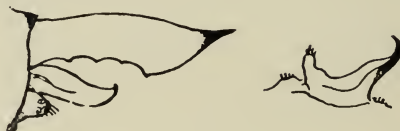
1. Abdomen *slender*, 23-25 mm. long.



146. **Leucorrhinia glacialis** Hagen.

Trans. Amer. ent. soc. 17: 234. 1890. Type locality: "Massachusetts."

Common,—p o n d s,
lakes.



May 19 to August 14.

Maine: Orono, Bradley (Harvey); Echo Lake, Mt. Desert (Johnson); Bar Harbor (Johnson).

New Hampshire: Mt. Washington, Franconia, Crawford Notch (Slosson); White Mts. (Hagen); North Conway (Allen); Lonesome Lake, Lincoln, Moultonboro (Howe); Meredith (Calvert).

Massachusetts: (Hagen); Concord (Howe); Sharon (Atwater).

2. Abdomen *spatulate*, 20-21 mm. long.

147. **Leucorrhinia frigida** Hagen.

Trans. Amer. ent. soc. 17: 231. 1890. Type locality: "Massachusetts; n. Red River, British America; Ontario; Dakota."



Common,— ponds, lakes.

June 7 to August 9.

Maine: Bradley (Harvey); Mr. Desert (Bullock); Echo Lake, Mt. Desert (Johnson); Bar Harbor (Johnson).

New Hampshire: Mt. Washington; Franconia (Slosson); Moultonboro (Howe); North Conway (Allen); Meredith (Calvert).

Vermont: Brandon (Dutton).

Massachusetts: Sherborn (Babcock); Concord (Howe); Wareham (Bangs); Sharon (Atwater); Hyannisport, Mt. Everett, Guilder's Pond (Johnson).

Connecticut: Litchfield (Woodruff).

b. Under lip black, with *sides white*.

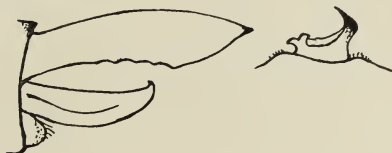
148. *Leucorrhinia proxima* Calvert.

Trans. Amer. ent. soc. **17**: 232. 1890. Type locality: "Manchester, Kennebec Co., Maine. . . . Pictou, Nova Scotia."

Rare,— bog margined ponds and lakes.

June 2 to July 24.

Maine: Oldtown, Orono (Harvey); Manchester (Wadsworth); Bar Harbor (Johnson).



New Hampshire: Mt. Washington, Franconia (Slosson); White Mts. (Hagen).

Massachusetts: Worcester (Hitchings).

Genus: *Celithemis* Hagen.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Celithemis elisa</i>	+	+		+	+	+
<i>eponina</i>				+	+	+
<i>monomelaena</i>				+		+
<i>ornata</i>	+	+		+		

A. Wings spotted with brown from *base to tip*.

a. Wings more or less suffused with yellow.

1. Wings under 27.5 mm. long.

149. **Celithemis elisa** Hagen.

Syn. Neur. No. Amer. 182. 1861. Type locality: "Bergen Hill, New Jersey; Chicago; New York."

Common,— brooks, ponds.

May 19 to August 21.

Maine: Bradley (Harvey); Mercer (Davis); Manchester (Wadsworth); Mt. Desert (Bullock); Kennebunkport (?).

New Hampshire: Derry (Burnham); Moultonboro (Howe).

Massachusetts: Concord (A. N. S., Phila., Howe); Cambridge, Natick (Hagen); Worcester (Hitchings); Woods Hole (Calvert, Osburn); Cuttyhunk (Ufford); Blue Hills (Clench); Tyngsboro (Howe); Provincetown (Morse, Benedict); Dover, Sherborn, West Chop (Morse); Webster (Bromley); Fall River (Holt); South Orleans, Brewster (Howe); Southbridge (Bromley); Woods Hole (Cushman); Hyannisport, Edgartown (Johnson); Framingham (Warden); Sharon (Atwater); Sherborn (Smith); Wareham (Bangs); Natick (M. C. Z.); Wollaston, Milton (Sprague).

Rhode Island: Bristol (Parker, Howe); Buttonwoods (Johnson).

Connecticut: Sachem Head (Calvert); Litchfield, New Hartford (Woodruff); Bethlehem, Burchard's Pond, Fairfield Co. (Benedict); New London (Osburn).

2. Wings over 31 mm. long.

150. **Celithemis eponina** (Drury).

Ill. nat. hist. 2: 86. 1773. Type locality: "Boston in New England."

Common,— ponds.

June 21 to September 3.

Massachusetts: Saugus, Boston, Natick (Hagen); Sherborn (Babcock); Worcester (Hitchings); Concord (Howe); Fall River (Holt); Wellesley (Morse); Wareham (Bangs); Auburndale (Johnson); West Peabody (Little); Woods Hole (Osburn); Saugus (M. C. Z.).



Rhode Island: Block Island (Woodruff).

Connecticut: Litchfield Co., Bethlehem (Benedict); New London (Osburn).

b. Wings *not suffused* with yellow.

151. **Celithemis monomelaena** Willm.

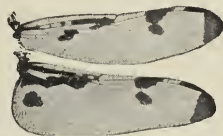
Ohio nat. 10: 155. 1910. Type locality: Whitley County, Indiana."

Rare,—

July 8 to August 14.

Massachusetts: Wareham (Bangs).

Connecticut: No. Guilford (Howe).



152. **Celithemis ornata** (Ramb.).

Ins. Nevr. 96. 1842. Type locality: "L'Amerique septentrionalis."

Rare,—

July 2 to August 14.

Maine: Bradley (Harvey); Manchester (Wadsworth).

New Hampshire: Manchester (Burnham).

Massachusetts: Dracut (B. S. N. H.); Sherborn (Morse); Wareham (Bangs); Fall River (Holt); Hyannisport (Johnson); South Orleans (Howe).



Group 8

Tramea



Hind wings *dark* at base.

Pantala



Hind wings *clear, yellowish* at base.

Genus: Tramea Hagen.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Tramea abdominalis				+		
carolina				+	+	+
lacerata				+		

A. Front wings *clear*. a. Hind wings with *dark narrow*
(6 mm.) basal band.

153. **Tramea abdominalis** (Rambur).

Ins. Nev. 37. 1842. Type locality: "des Antilles... L'Amerique
septentrionalis... Cuba."

One record.

August 30.

Massachusetts: Nantucket (Hagen).

b. Hind wings with *dark wide* (10 mm.) basal band.

154. **Tramea carolina** (Linn.).

Amoen. acad. 6: 411.

1763. Type locality: "Caro-
lina."

Uncommon, — ponds,
migratory along
coast in autumn.



June 1 to September 8.

Massachusetts: Natick
(Hagen); Concord, Chatham (Howe); Wareham (Bangs).

Rhode Island: Matoonoc ? (Simonds); Middletown (Howe).

Connecticut: Sachem Head (Calvert); Darien (Johnson); Bur-
chard's pond, Fairfield Co. (Benedict); New London. (Osburn).

B. Front wings with *dark spot* at base.

155. **Tramea lacerata** Hagen.

Syn. Neur. No. Amer. 145. 1861. Type locality: "Pecos River,
Western Texas," etc.

One record,—

September 6, 1868.

Massachusetts: Chelsea (Sanborn, B. S. N. H.).

Genus: *Pantala* Hagen.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Pantala flavescens</i>	+			+	+	

156. ***Pantala flavescens*** (Fabr.).

Ent. syst. suppl. 285. 1798. Type locality: "India."

Uncommon,—ponds.

August 9 to September

New Hampshire: Amoskeag Falls (Burnham).

Massachusetts: Boston (Cabot); Wareham (Bangs).

Rhode Island: Bristol (teneral) (Howe).

Seasonal Distribution in New England

ZYGOPTERA

Earliest Species		Latest Species						
<i>Agrion maculatum</i> April 16		<i>Enallagma congner</i> October 9						
	April	May	June	July	Aug.	Sept.	Oct.	
Total number flying in	1	16	30	33	30	15	2	

ANISOPTERA

Earliest Species		Latest Species						
<i>Williamsonia lintneri</i> April 30		<i>Sympetrum vicinum</i> November 8						
	April	May	June	July	Aug.	Sept.	Oct.	Nov.
Total number flying in	1	21	52	58	43	20	7	1
	—	—	—	—	—	—	—	—
Total Odonata flying in	2	37	82	91	73	35	9	1

Corrections and Additions

CORRECTIONS

The Rhode Island and Connecticut records at the top of page 60 belong at the bottom of the page under *S. tenebrosa*.

ADDITIONS

PART I

Agrion aequabile

Massachusetts: Chelmsford (Howe).

Agrion maculatum

Maine: Bar Harbor (Johnson, Merrill).

Massachusetts: Sharon (Atwater); Chatham (Howe); Forest Hills (Henshaw).

Lestes eurinus

June 1 to July 21

Massachusetts: Framingham (Warden).

Lestes unguiculatus

September 8

Massachusetts: Framingham (Warden); Chatham (Howe).

Rhode Island: Middletown, Bristol (Howe).

Lestes uncatus

Maine: Bar Harbor (Johnson).

Vermont: Leicester (Dutton).

PART II

Lestes forcipatus

Massachusetts: Framingham (Warden); Chatham (Howe).

Rhode Island: (Howe).

Lestes rectangularis

Massachusetts: Framingham (Warden); Chatham (Howe).

Rhode Island: Warren (Howe).

Lestes vigilax

September 7

Massachusetts: Eastham, South Orleans, Brewster (Howe); Framingham (Warden).

Rhode Island: Bristol (Howe).

Argia moesta

Maine: Mt. Desert (Merrill).

Argia violacea

September 13

Maine: Bar Harbor (Johnson, Merrill).

Massachusetts: Framingham (Warden); Orleans (Howe).

Enallagma durum

Massachusetts: South Orleans (Howe).

Enallagma hageni

Maine: Bar Harbor (Johnson).

Massachusetts: Concord (Howe).

Enallagma calverti

Massachusetts: Pepperill (Howe).

Enallagma ebrium

Maine: Mt. Desert (Merrill).

Massachusetts: Framingham (Warden); Belmont (Howe).

Rhode Island: Bristol (Howe).

Enallagma traviatum

June 19

Enallagma minusculum

Maine: Mt. Desert (Merrill).

Massachusetts: Eastham, South Orleans (Howe).

Enallagma doubledayi

August 23

Massachusetts: South Orleans (Howe).

Enallagma civile

Maine: Mt. Desert (Merrill).

Massachusetts: Brookline, Chatham, Orleans, South Orleans (Howe); Sharon (Atwater); New Bedford (Holcomb); Framingham (Warden); Truro (M. C. Z.).

Enallagma geminatum

June 15

Framingham (Warden).

Enallagma exsulans

Maine: Mt. Desert (Merrill).

Enallagma signatum

May 26

Massachusetts: Chatham (Howe).

Nehalennia irene

Maine: Bar Harbor (Johnson).

Vermont: Brandon (Dutton).

Massachusetts: Chatham (Howe).

Nehalennia gracilis

Vermont: Brandon (Dutton).

Massachusetts: Cedar Pond, Wenham (Morse).

Amphiagrion saucium

Vermont: Brandon (Dutton).

Chromagrion conditum

May 30

Ischnura verticalis

Maine: Bar Harbor (Johnson); Mt. Desert (Merrill).

Vermont: Leicester (Dutton).

Massachusetts: Brookline, Belmont, Wellfleet, Eastham, Brewster, Chatham (Howe); Sharon (Atwater); Framingham (Warden); Truro (M. C. Z.).

Rhode Island: Bristol, Warren (Howe).

Ischnura posita

Massachusetts: Chatham, Wellfleet (Howe).

Rhode Island: Warren, Bristol (Howe).

Anomalagrion hastatum

Rhode Island: Middletown, Bristol (Howe).

PART III

Cordulegaster maculatus

Massachusetts: Pepperill (Hawker).

Progomphus obscurus

Massachusetts: South Orleans (Howe).

Gomphus parvulus

Vermont: Starksboro (Dutton).

Gomphus exilis

Maine: Bar Harbor (Johnson).

Massachusetts: Sharon (Atwater).

Connecticut: Pomfret (Howe).

Dromogomphus spinosus

Vermont: Brandon (Dutton).

Massachusetts: Framingham (Warden); Sharon (Atwater).

PART IV

In tabular plate of Zygoptera the words Aeshnidae and Libellulidae should be reversed.

Page 30: for femora on diagram read femur.

Basiaeschna janata

New Hampshire: Meredith (Calvert).

Massachusetts: Carver (Shurtleff).

Boyeria vinosa

September 15

- New Hampshire: Jackson (Skinner).
- Massachusetts: Brookline (Shurtleff).
- Connecticut: Twin Lakes (Calvert).

Gomphaeschna fuscillata

May 4 to July 9

- New Hampshire: Meredith (Calvert).
- Massachusetts: Sherborn (Smith).

Anax junius

May 4

- Maine: Iron Bound Island (Hopkins).
- Massachusetts: Chelmsford, Orleans, Chatham (Howe); Framingham (Warden)
- Nantucket (Bangs).
- Rhode Island: Warren (Howe).
- Connecticut: Lakeville (Calvert).

Aeshna umbrosa

- Maine: Mt. Desert (Merrill); Iron Bound Island (Hopkins).
- New Hampshire: Jackson (Calvert).
- Vermont: Rutland (Johnson).
- Massachusetts: Framingham (Warden); Orleans (Howe); Woods Hole (Calvert).
- Connecticut: Twin Lakes (Calvert).

Aeshna interrupta

- Maine: Iron Bound Island (Hopkins).
- New Hampshire: Jackson (Skinner).

Aeshna clepsydra

- Massachusetts: Chatham (Howe); Framingham (Warden); Brookline (Shurtleff);
- Woods Hole (Calvert); Wellfleet (M. C. Z.).

Aeshna eremita

- New Hampshire: Jackson (Calvert).

Aeshna verticalis

- Massachusetts: Brookline (Shurtleff); Lexington (Banks).
- Strike out one: Manchester (Wadsworth).

Aeshna canadensis

June 22

- New Hampshire: Meredith (Calvert).
- Vermont: Leicester (Dutton).
- Massachusetts: Chatham (Howe); Woods Hole (Calvert).

Aeshua tuberculifera

- Connecticut: Lakeville (Calvert).

Didymops transversa

- Maine: Bar Harbor (Johnson).
- Massachusetts: Chelmsford (Howe).

Dorocordulia lepida

- New Hampshire: Meredith (Calvert).

Dorocordulia libera

June 7 to August 29

- Maine: Bar Harbor (Johnson).
- New Hampshire: Meredith (Calvert).
- Vermont: Brandon (Dutton).
- Massachusetts: Wareham (Bangs); Fall River (Holt); Lexington (Banks).

Epiaeschna heros

- Massachusetts: Lexington (Banks).

Epicordulia princeps

- Massachusetts: Chatham (Howe).

Somatochlora forcipata

- Vermont: Brandon (Dutton).

Somatochlora kennedyi

May 30

New Hampshire: Meredith (Calvert.).

Cordulia shurtleffi

Maine: Bar Harbor (Johnson).

New Hampshire: Meredith (Calvert).

Tetragoneuria cyanosura

Vermont: Brandon (Dutton).

Massachusetts: Orleans (Howe); Milton (Warden)

Connecticut: Pomfret, Webster (Howe).

Tetragoneuria cyanosura similans

New Hampshire: Meredith (Calvert).

Tetragoneuria spinigera

July 23

New Hampshire: Meredith (Calvert).

Page 54 before line No. 100 *Dorocordulia lepida* (Hagen), readA. Last abdominal segments *not* spatulate.before line No. 101 *Dorocordulia libera* (Selys), readB. Last abdominal segments *spatulate*.**Recapitulation of New England Libellulidae (*Libellulinae*), and
Odonata.**

	Libellula	Platheimis	Perithemis	Nannothemis	Erythrodiplax	Erythemis	Pachydiplax	Sympetrum	Leucorrhinia	Celithemis	Tramea	Pantala		ZYGOPTERA	ANISOPTERA	TOTAL
Maine	5	1		1				5	5	2			= 19	31	72	103
New Hampshire	6	1		1		1		6	5	2		1	= 23	30	81	111
Vermont	4	1						3	2				= 10	14	30	44
Massachusetts	10	1	1	1	1	1	1	6	5	4	3	1	= 35	43	90	133
Rhode Island	3	1	1		1	1	1	5	1	2	1	1	= 21	22	28	50
Connecticut	7	1	1	1	1	1	1	4	2	3	1		= 24	27	56	93

Total Odonate Fauna for New England = 156 species.

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- 1919: **Howe, R. H. Jr.** Manual of the Odonata of New England, Part IV, *ibid*, 41-66.

(To be continued)

Memoir of the Thoreau Museum of Natural History: II Manual of the Odonata of New England

By **R. HEBER HOWE, Jr.**

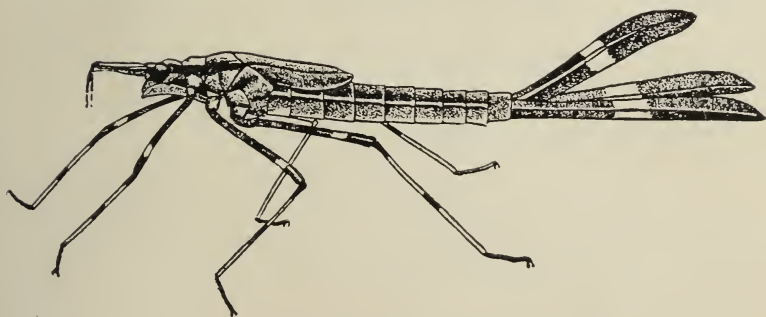
PART VI

MARCH 15, 1920.

LARVAE OR NYMPHS

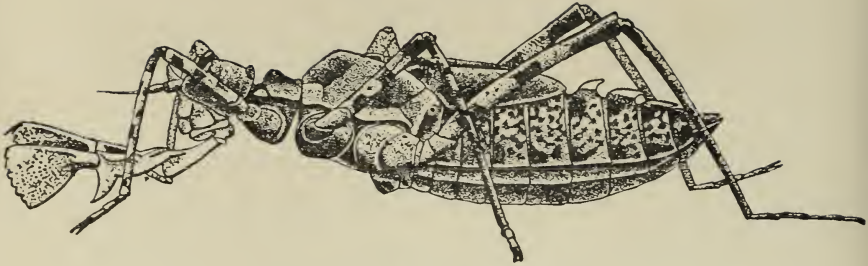
In this Manual have been treated only the adult or imago damsel and dragonflies. The nymphs which have had far less study are figured here only to show the Order characteristics. At some later date a complete treatment of them may be undertaken. The larvae or nymphs of the Odonata are aquatic. They inhabit ponds, lakes, brooks, and rivers, and their exuviae after the transformation of the imagos, are left attached to the stem of water plants, dead wood, or rocks, and are familiar to every student of nature. The works of Dr. J. A. Needham, Mr. Louis Cabot, and Dr. C. H. Kennedy include studies of many species, and will prove of much help in the study of the nymphs. The latter has kindly allowed me to reproduce drawings made by him.

Order: **Zygoptera**



A nymph of the Genus: **Agrion**

Order: Anisoptera



A nymph of the Genus: *Macromia*

Additions and Corrections

PART I

Agrion aequabile

Massachusetts: Winchendon (Russell).

Agrion maculatum

New Hampshire: Keene (Wheelock).

Massachusetts: Winchendon (Russell).

Lestes eurinus

Massachusetts: Winchendon (Russell).

Lestes forcipatus

Maine: Bar Harbor (Johnson).

Massachusetts: West Peabody (Little); Winchendon (Russell).

Lestes congener

Massachusetts: Winchendon (Russell).

Lestes uncatus

Massachusetts: Winchendon (Russell).

PART II

Lestes vigilax

Massachusetts: West Peabody (Little).

Argia violacea

Massachusetts: Winchendon (Russell).

Page 21: Under *Ischnura* for " ♀'s with *more* than 7 postcubitals " read with *more* than 8 postcubitals in hind wings.

Under *Aromalagrion* for " ♀'s with *less* than 7 postcubitals " read with 8 or *less* postcubitals in hind wings.

Ischnura verticalis

Massachusetts: Winchendon (Russell).

Rhode Island: Wickford (Atwater).

Ischnura posita

Rhode Island: Wickford (Atwater).

PART III

Cordulegaster diastatops

Massachusetts: Winchendon (Russell).

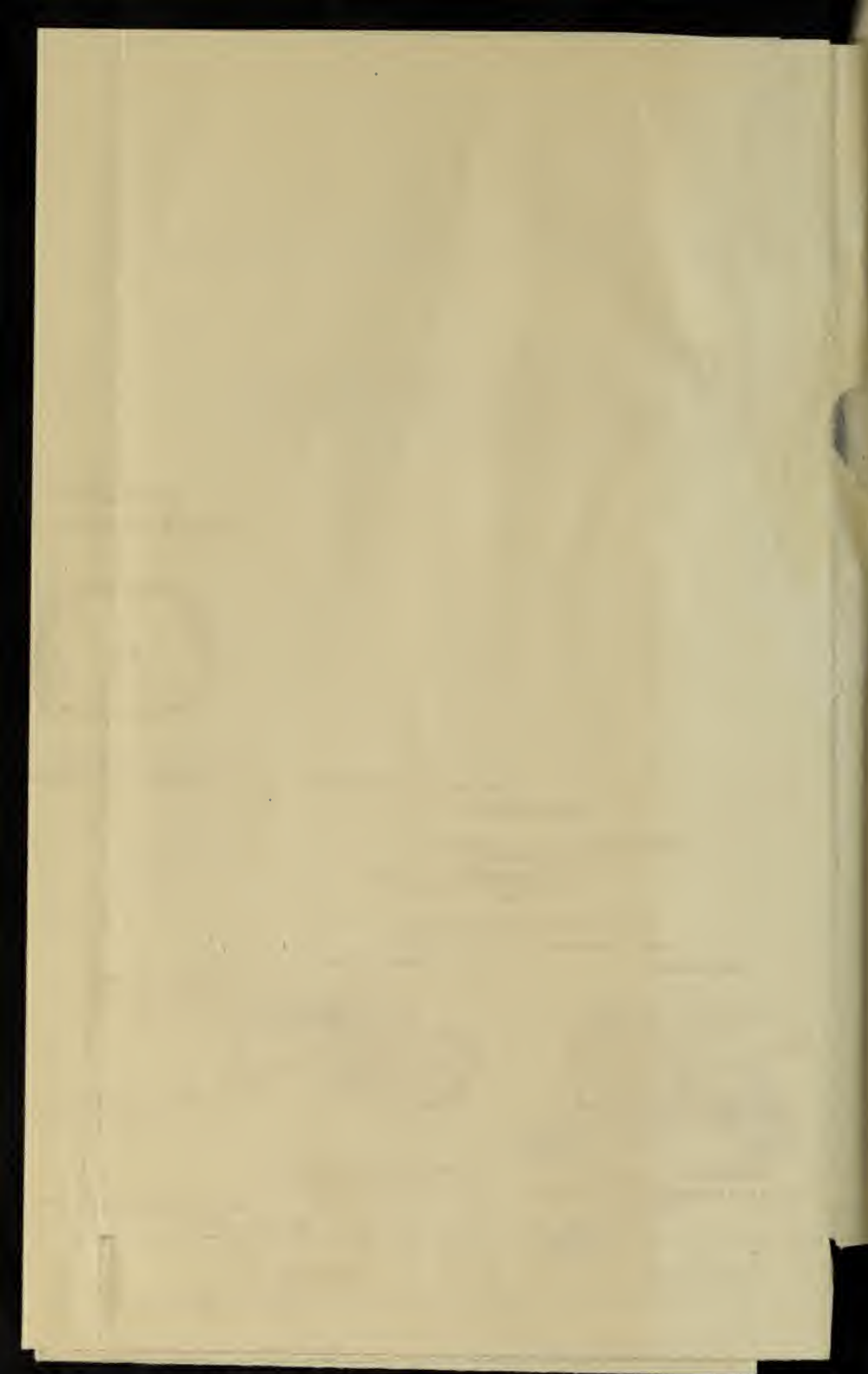
To habitat of *Progomphus obscurus* add: ponds.

Dromogomphus spinosus

June 16

Page 33 under *Enallagma hageni*

Massachusetts: strike out " Franconia (Howe)."



PART IV

Boyeria vinosa

Massachusetts: Winchendon (Russell).

Anax longipes

August 27.

Aeshna umbrosa

New Hampshire: Keene (Wheelock).

Massachusetts: Chatham (Howe).

Aeshna canadensis

Massachusetts: Winchendon (Russell).

Rhode Island: Bristol (Howe).

Aeshna constricta

New Hampshire: Fitzwilliam (Barnes).

Massachusetts: Winchendon (Russell).

Dorocordulia lepida

Maine: Bar Harbor (Johnson).

Dorocordulia libera

For "August 29" read August 9.

PART V

Libellula cyanea

Massachusetts: Winchendon (Russell).

Libellula exusta

May 28 to July 25.

Massachusetts: Winchendon (Russell).

Libellula exusta julia

June 4 to July 7

New Hampshire: Keene (Wheelock).

Massachusetts: Winchendon (Russell).

Libellula quadrimaculata

Vermont: Bristol (Dutton).

Massachusetts: Winchendon (Russell).

Libellula pulchella

New Hampshire: Keene (Wheelock).

Massachusetts: Winchendon (Russell).

Plathemis lydia

New Hampshire: Keene (Wheelock).

Massachusetts: Winchendon (Russell).

Sympetrum rubicundulum

Massachusetts: Winchendon (Russell).

Sympetrum vicinum

July 8

Massachusetts: Winchendon (Russell).

Sympetrum semicinctum

Massachusetts: Winchendon (Russell).

Leucorrhinia intacta

Massachusetts: Wakefield (Atwater).

Leucorrhinia frigida

Massachusetts: Winchendon (Russell).

Page 87 Group 8 should have been printed in yellow.

Page 91 under *Cordulegaster maculata* for "(Hawker)" read (Parker).

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From the following persons, in addition to those thanked in the prefatory remarks in Part I, I have received much valuable assistance in the preparation of this Manual, and to whom I desire to express my most sincere thanks: Drs. C. H. Kennedy, J. G. Needham, R. C. Osburn, Messrs. S. W. Bromley, C. W. Atwater, D. Merrill, W. G. Low, 3rd., W. J. Clench, F. C. Whitehouse, E. J. Smith, O. Bangs, H. C. Holcomb, and Miss Elizabeth B. Warden.

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Memoir of the Thoreau Museum of Natural History:
II. Manual of the Odonata of New England¹

By R. HEBER HOWE, JR.

NYMPHS
ZYGOPTERA

PART I

December 24, 1921

The pictorial keys of the imagos of the Odonata of New England have met with such general and gratifying approval that the author begins with this paper a similar work on the larvae or immature stages of the species treated in the former work. Many of those persons thanked before are giving substantial aid in this portion of the manual, among them particularly to be mentioned are Drs. P. P. Calvert, P. Garman, E. M. Walker, J. G. Needham, C. H. Kennedy, C. B. Wilson.

In Part VI of the former manual, page 95, an introductory statement was made in regard to the habitats of the nymphs. In Dr. Garman's valuable work on The Zygoptera, or Damselflies, of Illinois (Bull. Ill. State Lab. Nat. Hist. 12: 411-588. Pls. 58-73. 1917), complete descriptions and measurements are given for all but a few species here listed, and for permission to reproduce many of his figures of gill plates the author has both Dr. Garman and Dr. S. A. Forbes to thank. For permission to use the figure of the gill plates of *Enallagma ebrium* (Ent. News 26: Pl. 1. 1915) acknowledgement is due to Drs. Calvert and Cresson of the Entomological News. For the use of the figures of egg and first nymphal stage of *Enallagma signatum* the author is indebted to Dr. C. B. Wilson though the courtesy of the Bureau of Fisheries. For several figures of *Lestes*, etc., I am indebted to Dr. E. M. Walker. Two of the cuts used in the key are after published drawings by Dr. Kennedy. The full page plates were drawn for the author by Mr. E. N. Fischer.

¹ Contribution from the Entomological Laboratory of the Bussey Institution, Harvard University. — No. 192.

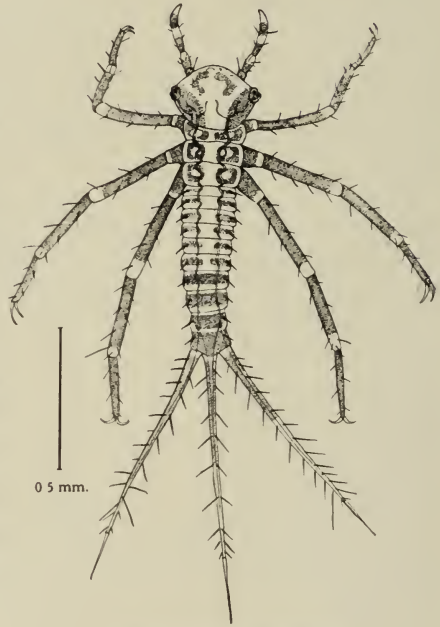
EGG

The eggs of the Zygoptera are ovoidal, about 1 mm. long, 200–300 of which are probably laid by one female. They are inserted in a more or less definite arrangement in the leaves of grasses, sedges (bur reed), flag (Iridaceae) above or below (female submerging) the water surface, and require a period of over 14 or 18 days to hatch, but the exact length of incubation is not known, though believed to be from 4–5 weeks.



LARVAE, NYMPHS OR NAIADS

After hatching the larvae are known as pronymphs. The nymphal life has been estimated at from 229–624 days. From 10–15 molts are required for full development. Emergence generally takes place before 8 A.M., or after 6 P.M., though the nymphs of this order frequently emerge between these hours. The cast skins found clinging to the stems of aquatic plants are called exuviae.



First true nymphal stage

FOOD

The nymphs are both phytophagous and predacious, and have been recorded as feeding upon the following organisms:

PLANTS	Copepoda	Diptera
Algae	Cyclops	Nematocera
Diatoms	Cypris	Chironomids
Navicula	Diaptomus	Ceratopogon
Encyonema	Phyllopoda	Orthocladius
Gomphonema	Cladocera	Corynoneura
Synedra ulna	Anomopoda	Culicids
Fragilaria	Daphnia	Culex
Nitzschia acicularis	Bosmina	Simuliids
Chlorophyceae	Pleuroxus	Brachycera
Desmids	Simocephalus	Dolichopdids
Closterium	Arachnida	Anthomyiids
Oedogonium	Hydrachinida	Syrphids
Ulothrix	Dolomedes	Geomyzidids
Cyanophyceae	Hexapoda	Coleoptera
Oscillatoria	Ephemera	Berosus
	Callibaetis	Lepidoptera
	Hexagenia	Ancyloxypha
ANIMALS	Odonata	Mollusca
Protozoa	Zygoptera	Physa
Paramecium	Ischnura	Planorbis
Crustacea	Enallagma	
	Hemiptera	
	Aphids	

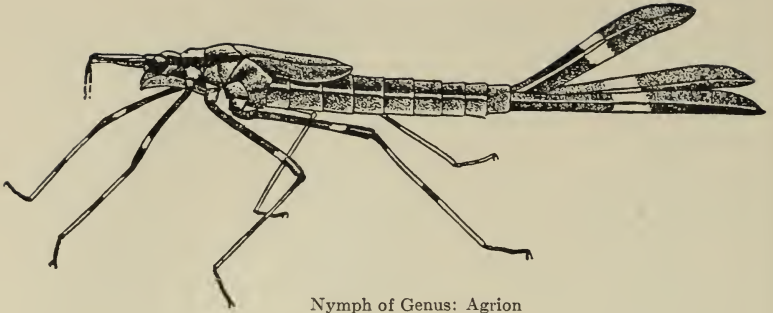
ENEMIES

The eggs, and later during nymphal life the larvae are the prey of fishes of whose food they often comprise from 10–25 per cent. They are also preyed upon by Protozoa (Vorticella), Coelenterata (Hydra), Vermes (Nematodes), and by certain Hymenoptera, Coleoptera (Dytiscus, Zaitha), aquatic Hemiptera, (Notonecta, Ranatra, Belostoma), Arachnida (including Mites), frogs, newts, reptiles (Chrysemys), and diving birds (Colymbus), as well as by larvae of their own or other Odonate species. They are attacked also by Algae (Oedogonium, Diatoms), and Fungus (Saprolegniales) growths.

TENERAL LIFE

The freshly emerged imago, called a teneral, has been observed to take five and one half hours to complete its full development.

Order: Zygoptera



Nymph of Genus: Agrion

Family: Agrionidae

Subfamily: Agrioninae

Genus: Agrion

Nymphs inhabit running water, — brooks and small streams.

1. *Agrion amatum*. Nymph unknown.

2. *Agrion dimidiatum apicale*. Nymph unknown.

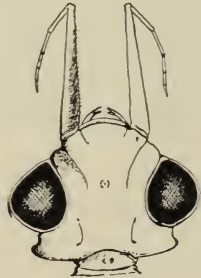
A, — Basal segment of antennae *longer* than head.

3. *Agrion aequabile*.



B, — Basal segment of antennae *not longer* than the head.

4. *Agrion maculatum*.



Genus: Hetaerina

Nymphs inhabit running water, — streams and rivers.

5. Hetaerina americana.

Genus: Lestes

(For detailed figures see Walker, Can. Ent. **46**: pl. 13, 14, 23, 1914.)

Nymphs inhabit still water, — ponds and lakes.

A, — Lateral spines *never* present on abdominal segment *two*.

Mentum *reaching beyond* base of coxae.

a. *Four or five* setae on each lateral labial lobe.



6. Lestes congener.



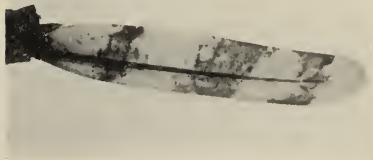
Branchial gill plates

b. *Three* setae on each lateral labial lobe.



1. Lateral spines *always* present on abdominal segment *four*.

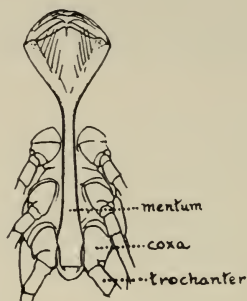
7. Lestes eurinus.



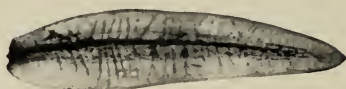
II. Lateral spines *never* present on abdominal segment *four*.

1. Mentum of labium reaching *to apex* of hind coxae, or *beyond*.

*Mentum of labium
reaching *to apex* of hind
coxae



8. *Lestes uncatus*.



**Mentum of labium reaching *beyond*
apex of hind coxae to apex of tro-
chanter.



9. *Lestes disjunctus*.

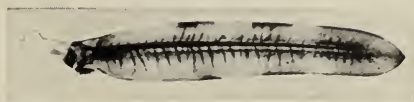


2. Mentum of labium reaching *only*
to middle of hind coxae.



*Mental setae *five* on each side of labium.

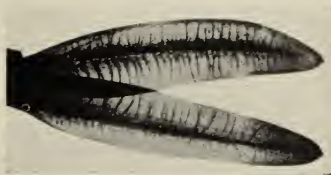
10. *Lestes rectangularis*.



**Mental setae *six* or *seven* on each side of labium.

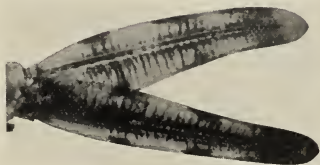
†Gill plates *unbanded*.

11. *Lestes unguiculatus*.

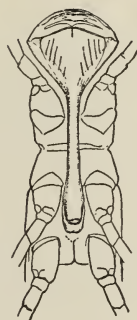


††Gill plates *banded*.

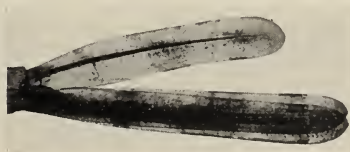
12. *Lestes forcipatus*.



B,— Lateral spines *always* present on abdominal segment *two*. Mentum *not reaching* base of hind coxae.



13. *Lestes vigilax*.



14. *Lestes inequalis*. Nymph unknown.

Genus: Argia

Nymphs inhabit ponds and lakes, and slow running and even rapid streams.

A, — Gill plates *ovate*, tips *inconspicuous*.

15. *Argia moesta*.



B, — Gill plates *spatulate*, tips *conspicuous*.

16. *Argia violacea*.



17. *Argia translata*. Nymph unknown.

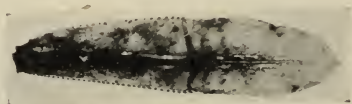
Genus: Enallagma

Nymphs inhabit ponds, lakes and streams.

(For key to ten of the following species see Garman, Bull. Ill. State Lab. 12: 517-518, 1917.) No good characters are yet known for the separation of all the species of this genus. The gill plates will serve for identification in most cases.

18. *Enallagma aspersum*. Nymph unknown.

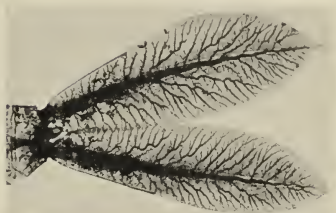
19. *Enallagma calverti*.



20. *Enallagma carunculatum*.



21. *Enallagma civile*.



22. *Enallagma cyathigerum*.



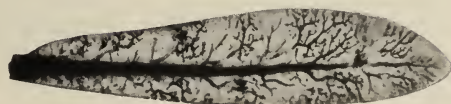
23. *Enallagma double-dayi*.



24. *Enallagma durum*.



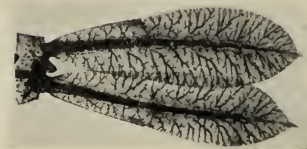
25. *Enallagma ebrium*.



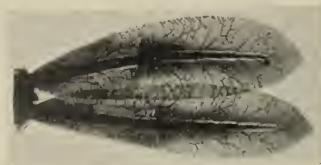
26. *Enallagma exsulans*.



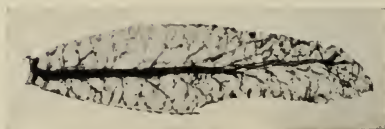
27. *Enallagma geminatum*.



28. *Enallagma hageni*.



29. *Enallagma laterale*.



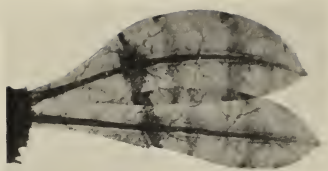
30. *Enallagma signatum*.



31. *Enallagma traviatum*



32. *Enallagma vesperum*



33. *Enallagma divagans*. Nymph unknown.

34. *Enallagma minusculum*. Nymph unknown.

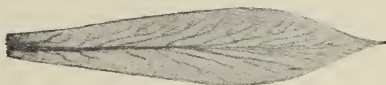
35. *Enallagma pictum*. Nymph unknown.

Genus: *Nehalennia*

(For detailed figures see Walker, Can. Ent. 45: pl. 1, 1913.)
Nymphs inhabit spring runs, bogs, grassy ponds and lakes.

A, — Gills *unspotted*, head with 4 to 6 hind marginal *spines*.

36. *Nehalennia*
gracilis.



B, — Gills *spotted*, head with 12 or more hind marginal *spines*.

37. *Nehalennia irene*.



Genus: *Amphiagrion*

Nymphs inhabit meadow brooks and marshy bogs.

38. *Amphiagrion saucium*.



Genus: Chromagrion

Nymphs inhabit ponds, small lakes and streams.

**39. Chromagrion
conditum.**



Genus: Ischnura

Nymphs inhabit streams and rivers, ponds and lakes, *i.e.* permanent water.

A, — Gill plates with *strong arcuate bands*.

40. Ischnura posita.



B, — Gill plates with *no or only slight arcuate bands*.

41. Ischnura verticalis.



42. *Ischnura kellicotti*. Nymph unknown.

43. *Ischnura ramburii*. Nymph unknown.

Genus: Anomalagrion

Nymphs inhabit springy bogs, and stagnant marsh water.

**44. Anomalagrion hasta-
tum.**



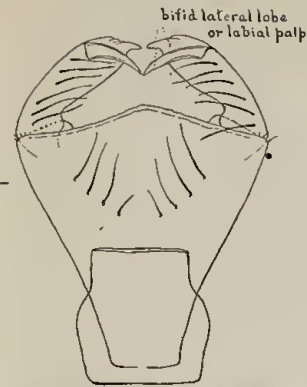
PICTORIAL KEY TO ZYGOPTERA NYMPHS

ANISOPTERA = DRAGON-FLIES



Head *never* as wide as the thorax or abdomen (see key to ANISOPTERA).

COENAGRIONINAE



Labium *triangulate* without median cleft, lateral lobes *bifid*.

ARGIA



Gills *half* as broad as long.

AMPHIAGRION



Gills widest *medially*, one third as broad as long, *unpigmented*.

GROUP 2



Hind margins of head *angulate*.

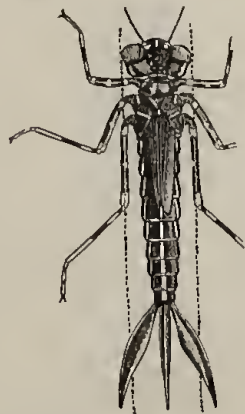
CHROMAGRION



Gills widest *distally*, one sixth as broad as long, *pigmented*.

ODONATA

ZYGOPTERA = DAMSEL-FLIES



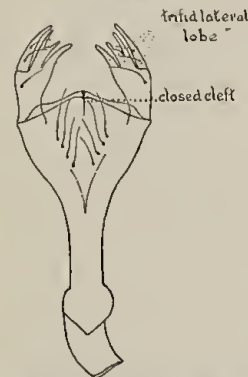
Head *always* wider than the thorax or abdomen.

COENAGRIONIDAE



Basal segments of antenna of nearly equal length.

LESTINAE
LESTES



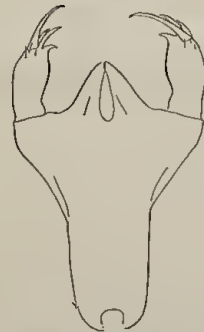
Labium *goblet-shaped* with short median cleft, lateral lobes *trifid* or *trifid denticulate*.

GROUP 1



Gills *one third* as broad as long.

HETAERINA



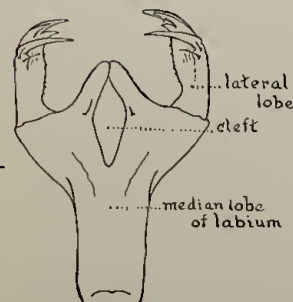
Labium *partially cleft*, only to base of lateral lobe.

AGRIONIDAE



Basal segment of antenna *very long*; length equal to all remaining six distal ones.

AGRION



Labium *deeply cleft* to below base of lateral lobe.

NEHALENNIA



Gills with tracheal branches *medially* more numerous.

GROUP 3



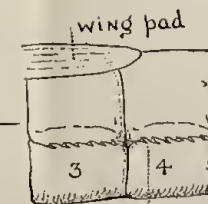
Hind margins of head *rounded*.

GROUP 4



Gills with tracheal branches *equally* distributed.

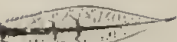
GROUP 5



seta of lateral keel

Lateral keel of abdomen *with* setae. Gills generally *pigmented*.

ISCHNURA



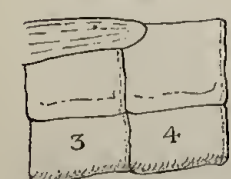
Gill tips *slender pointed*.

ENALLAGMA



Gill tips *bluntly pointed*.

ANOMALAGRION



Lateral keel of abdomen *without* setae. Gills *unpigmented*.



Scarabaeus sacer



Scarabaeus sacer

PLATE 1

In the following full page illustrations the last few segments of the abdomen are shown rotated, exposing the branchial plates in profile. To the left of each complete drawing of the nymph the closed labium as seen from the ventral side is shown. In plate X, in the complete drawing, the labium is shown extended, and in the drawing of the labium the raptorial setae show through the mentum.



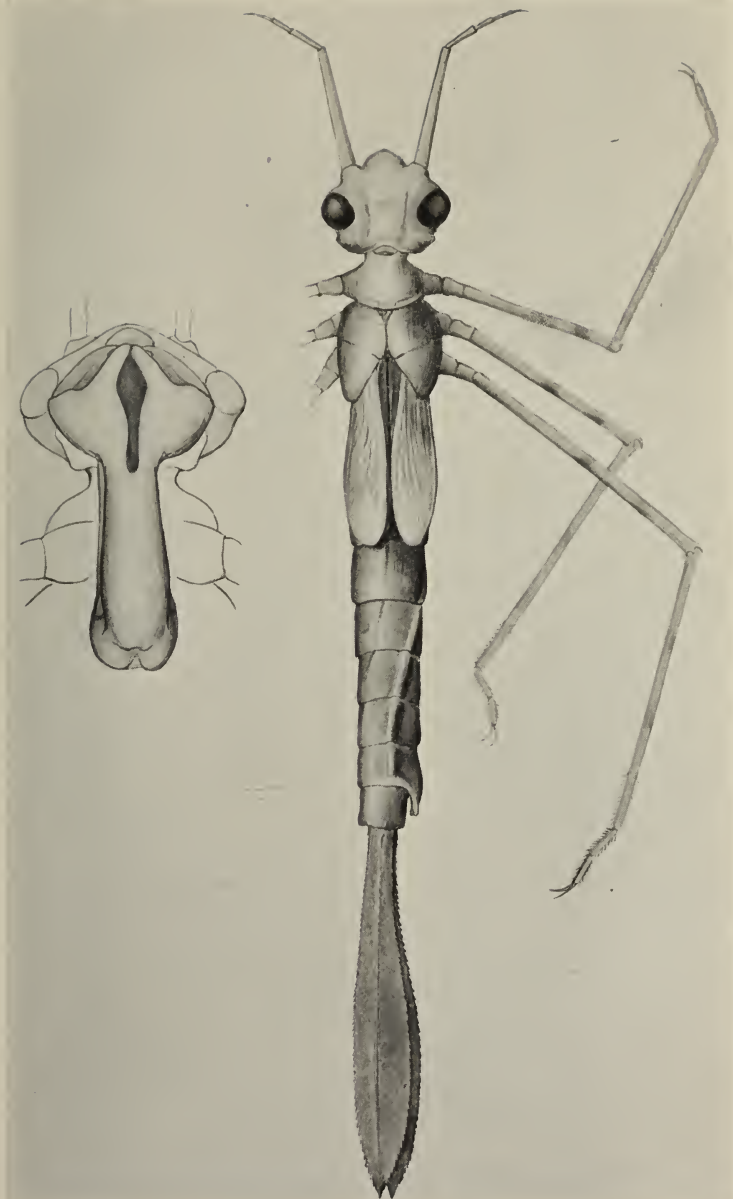


PLATE I. *AGRION AEQUABILE*

5 X Nat. Size

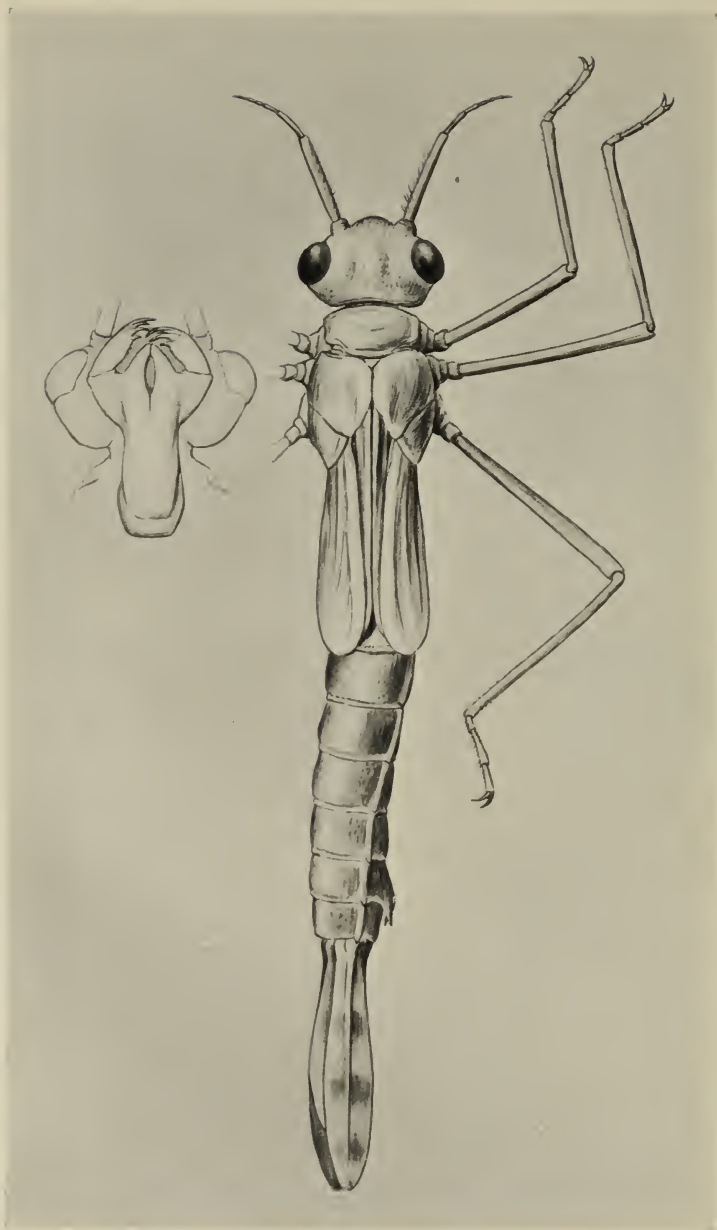
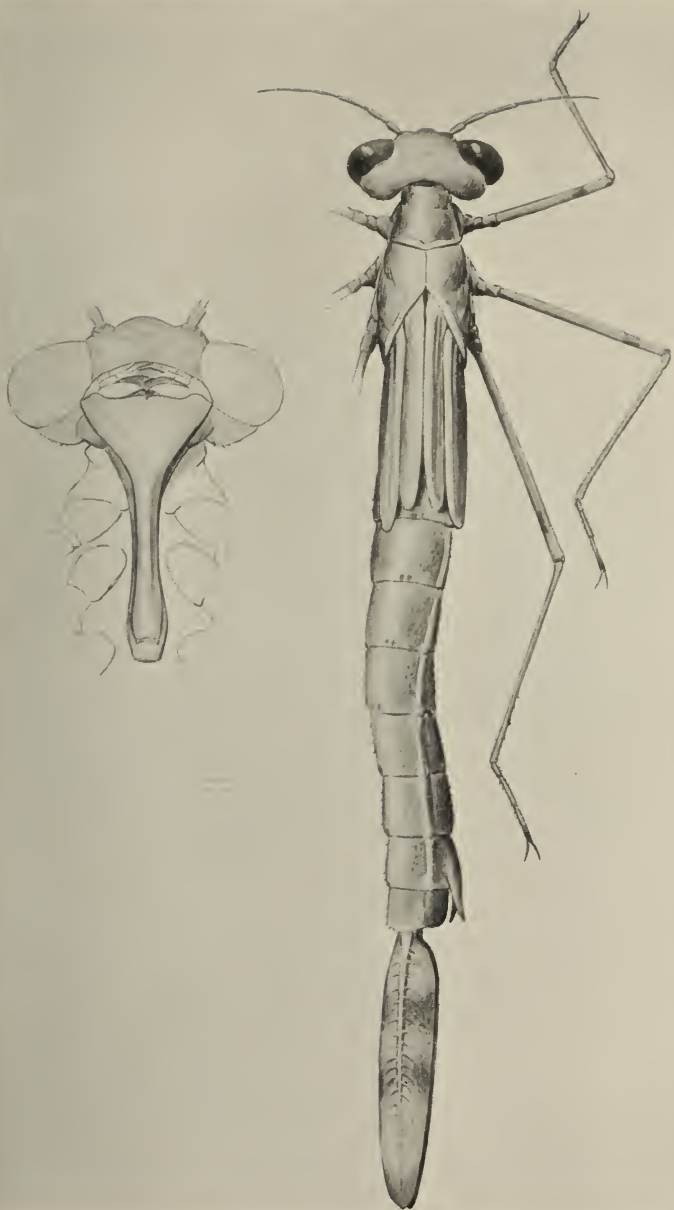


PLATE II. HETAERINA AMERICANA

5 × Nat. Size



6 × Nat. Size

PLATE III. LESTES RECTANGULARIS

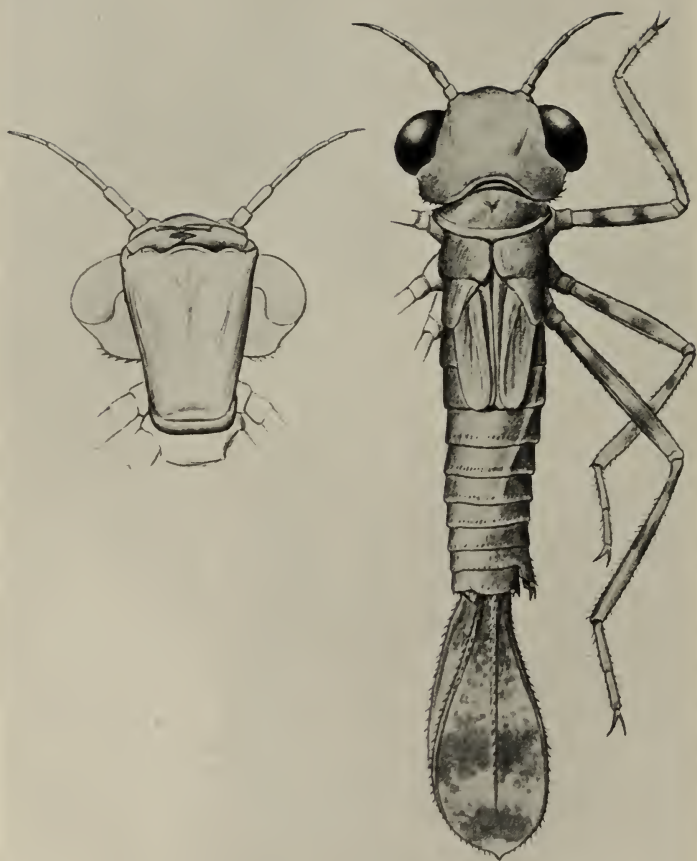


PLATE IV. ARGIA VIOLACEA

9 × Nat. Size

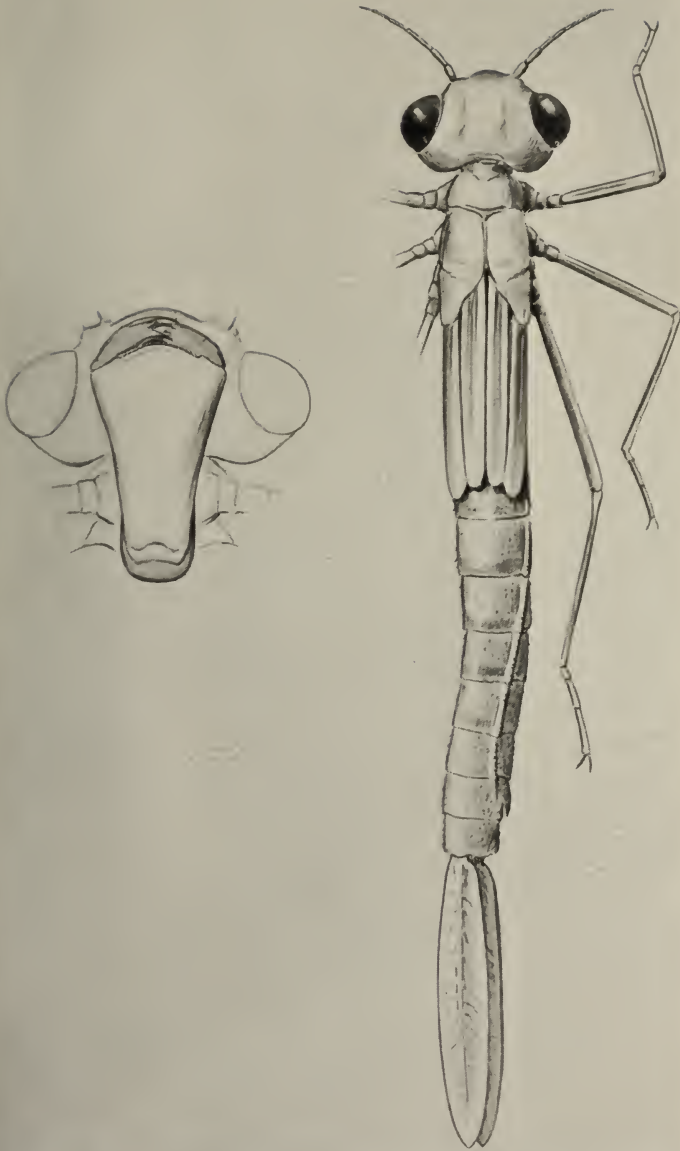


PLATE V. ENALLAGMA DURUM

6 X Nat. Size

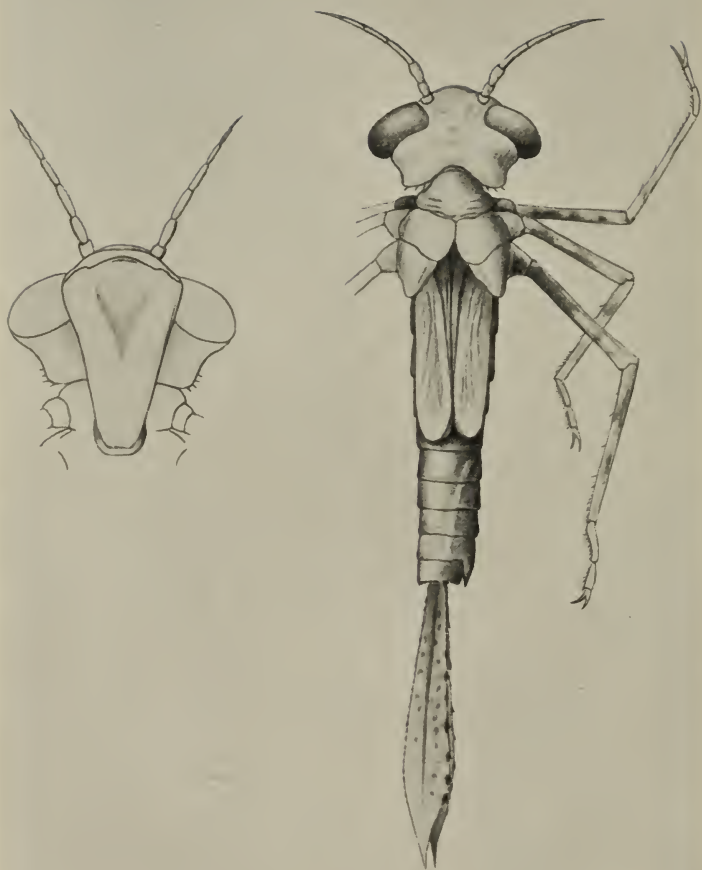


PLATE VI. CHROMAGRION CONDITUM

7× Nat. Size

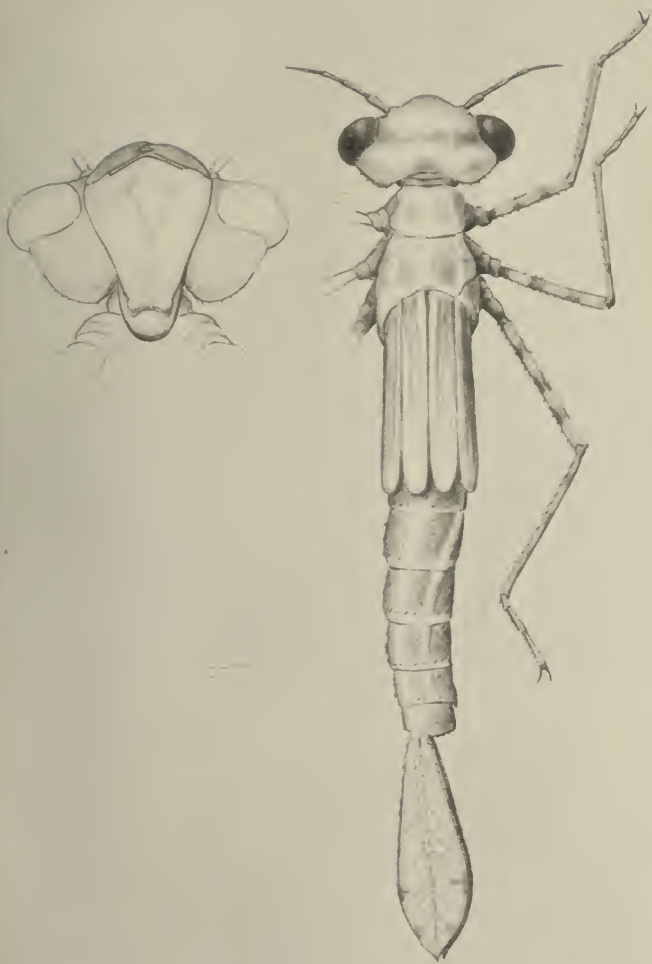


PLATE VII. NEHALENNIA IRENE

9 × Nat. Size

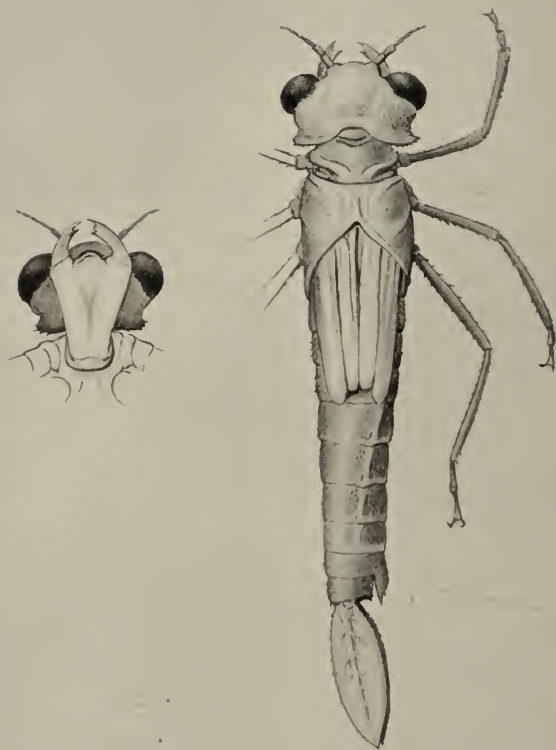


PLATE VIII. AMPHIGRION SAUCIUM

6 X Nat. Size

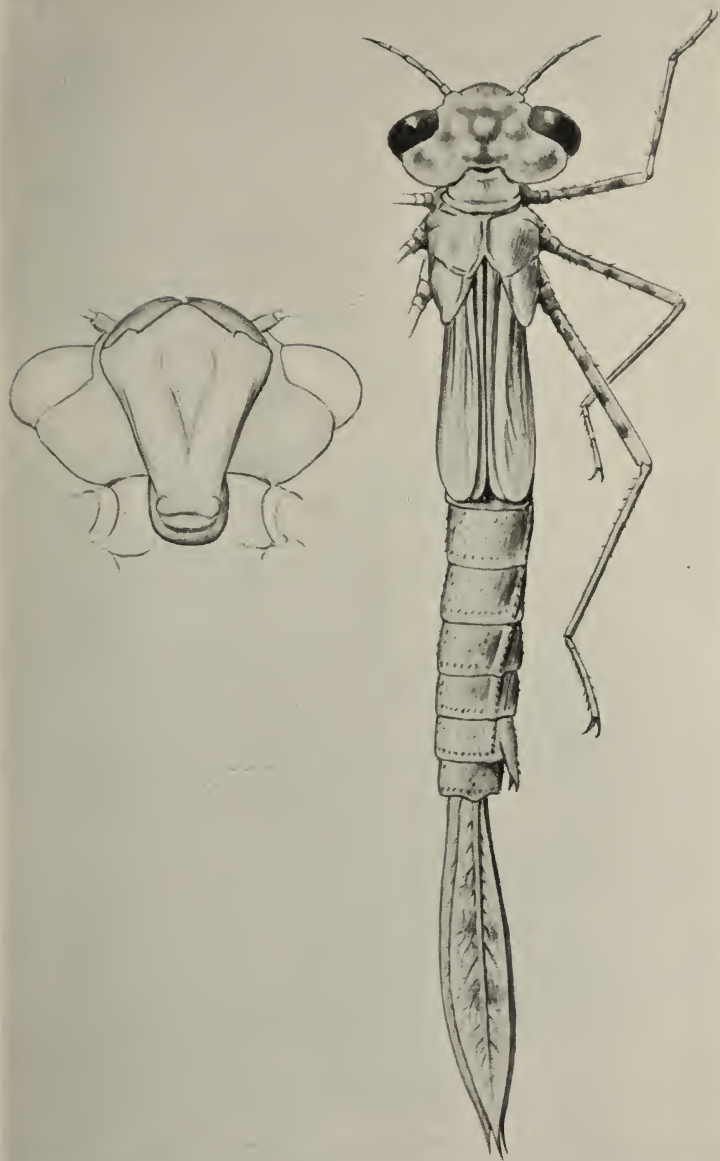


PLATE IX. ISCHNURA VERTICALIS

9 × Nat. Size

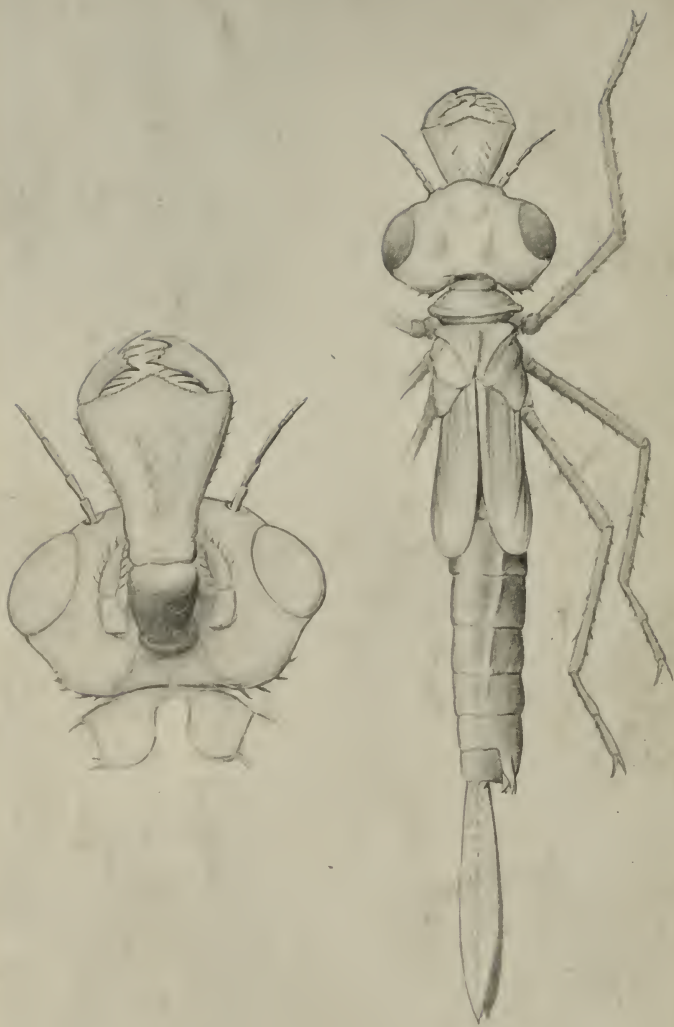


PLATE X. ANOMALAGRION HASTATUM

8 × Nat. Size

Memoir of the Thoreau Museum of Natural History: II

Supplement to Manual of Odonata of New England

By R. HEBER HOWE, Jr.

March 15, 1921.

157. *Argia translata* Hagen.
Bull. Acad. Roy. Belg. (2) 20:410, 1865. Type locality:
"Venezuela, Porto-Cabello, par Appun."
One instance,—ponds.
July 27, 1920.
Connecticut: Pistapaug pond, Wallingford (Garman).
b. Back of head black, abdomen banded with yellow.
158. *Cordulegaster erroneus* Hagen.
Bull. Acad. Roy. Belg (2) 46:688, 1878. Type locality:
"Caroline du Nord aux environs de Morgantown."
June 8, 1911.
One instance, teneral.
Connecticut: Wallingford (Walden).
159. *Gomphus amnicola* Walsh.
Proc. Acad. Nat. Sci., Phila., 396, 1862. Type locality:
"Illinois."
Dr. Muttkowski (ibid. 90) records this species from
"Me.," but the record is untraceable.
Massachusetts: Amherst (Bromley).
160. *Gomphus villosipes* Selys.
Bull. Acad. Roy. Belg. 21:53, 1852. Type locality:
"Etats-Unis."
Rare,—one instance.
June 15 to 20.
Massachusetts: Amherst (Bromley).
Note: This species was included as from Massachusetts
by Dr. P. P. Calvert (Tran. Amer. Ent. Soc. 20:245,
Nat. Hist. 18:45, 1875), but was not included in Dr.
Calvert's New England List, as Hagen later (Bull.
Acad. Roy. Belg (2) 46:458, 1878) found the speci-
men from Natick to be *G. furcifer*.
c. Brown of hindwings reaching to *nodus*.
161. *Tetragoneuria semiquaea* (Burm.)
Handb. Ent. 2:858, 1839. Type locality: "Savannah."
Massachusetts: Dr. Muttkowski includes this species from
Massachusetts in his Studies in Tetragoneuria
(Odonata), Bull. Wis. Nat. Hist. Soc. 9:120, 1911.
162. *Libellula exusta julia* (Uhler)
Proc. Acad. Nat. Sci., Phila., 88, 1857. Type locality:
"Fort Steilacoom, W. Territory."
May 31.
Maine: Ogunquit (Blair-Smith).
New Hampshire: Jaffrey (Johnson).

Massachusetts: Amherst (Bromley); Framingham (Warden); Salem (Walker); West Roxbury (B. S. N. H.); Plum Island (Morse).
Connecticut: New Haven (Walden).

*Legs entirely black.

163. *Sympetrum atripes* (Hagen)

U. S. Geol. Sur. Terr. Colo. 588, 1873. Type locality: "Yellowstone."

New Hampshire: Meredith, Sept. 9, 1919 (see Ent. News, 28:1921).

**Sides of thorax with two yellow dots.

164. *Sympetrum corruptum* (Hagen).

Syn. Neur. No. Amer. 171, 1861. Type locality: "Pecos River, Western Texas," etc.

June 10 to September 10.

Massachusetts: Chatham (Howe); Plum Island, Essex Co. (Morse).

Connecticut: New Haven (Walden).

ADDITIONS AND CORRECTIONS

Agrion amatum

July 19

Massachusetts: Petersham, 1,000 ft. (Wheeler).

Agrion aequabile

Maine: Monmouth (Frost).

Massachusetts: Middleton (Walker); Amherst (Bromley); Wareham (Bangs); Boston (Brues); Forest Hills (B. S. N. H.).

Connecticut: Mt. Carmel (Walden).

Agrion maculatum

Maine: Liberty (Frost).

New Hampshire: Fitzwilliam (Fenn).

Massachusetts: Petersham (Wheeler); West Roxbury (Taylor); Framingham (Warden); Middleton (Walker); Boston (Brues); Amherst (Bromley); Woburn (Anderson); Middleton, West Peabody (Morse); Forest Hills (Wheeler).

Connecticut: Goshen (Zappe).

Hetaerina americana

Massachusetts: Amherst (Taylor); Belchertown (M. C. Z.); Miller's Falls (Bromley).

Connecticut: Kent (Britton).

Lestes eurinus

Massachusetts: Amherst (Bromley); Woods Hole (Gray).

Connecticut: (C. A. E. S.).

Lestes congener

July 4.

Maine: Chamberlain lake (Cushman).

New Hampshire: Fitzwilliam (Fenn).

Massachusetts: Stony brook, Forest Hills, Petersham (Wheeler); Heath (Warden); Hyannis (Howe).

Connecticut: Branford (Vierick); Westville (Britton); New Canaan (Garman).

Lestes unguiculatus

Massachusetts: Wellfleet (Johnson); Quincy (Anderson); Wenham, Peabody (Morse); Amherst (Bromley); Nantucket (Howe).

Lestes uncatus

Maine: Ogunquit (Blair-Smith).
New Hampshire: Lake Sunapee (Johnstone).
Vermont: Bennington (Johnson).
Massachusetts: Woods Hole (Gray); Forest Hills (Brues); Amherst (Bromley); Winchester (Atwater); Salem, Swampscott (Walker).
Rhode Island: Wickford (Johnson).

Lestes disjunctus

Maine: Glen House, Bar Harbor (Johnson); Ogunquit (Blair-Smith).
Vermont: Shoreham (Cushman).
Massachusetts: Hyannis, Harwich, Chatham, Waltham (Howe); Amherst (Bromley).
Connecticut: West Thompson (Vierick).

Lestes forcipatus

Massachusetts: Woods Hole (Gray); Amherst (Bromley); Phillipston (Wheeler).
Rhode Island: Block Island (Howe).
Connecticut: New Haven (Moore, Britton); Lake Whitney (Vierick).

Lestes rectangularis

Maine: Ogunquit (Blair-Smith).
New Hampshire: Sunapee (Johnstone).
Massachusetts: Tisbury (Cushman); Petersham (Wheeler); West Peabody, Wenham (Morse); West Roxbury (Taylor); Winchester (Atwater); Heath (Warden); Amherst (Bromley).
Connecticut: Branford (Winkley); New Haven (Buttrick).

Lestes vigilax

Meredith Neck (Calvert), should be under New Hampshire.
Maine: Liberty (Cushman).
Massachusetts: West Peabody (Morse); Hyannis, Wianno, Harwich (Howe); Cohasset (Bryant); Amherst (Bromley).
Connecticut: New Haven (Vierick).

Lestes inequalis

Maine: Ogunquit (Blair-Smith).
Massachusetts: Winchester (Atwater).
Connecticut: Litchfield, Stratford (Garman).

Argia moesta

Massachusetts: Petersham (Wheeler); Brewster (Howe).
Connecticut: Putnam (Vierick).

Argia violacea

September 26

Maine: Liberty (Cushman).
New Hampshire: Fitzwilliam (Gallagher).
Vermont: Shoreham (Cushman).
Massachusetts: Petersham (Wheeler); Cohasset (Bryant); Pocasset (Cushman); Danvers, Wenham (Morse); Ashburnham, Wianno (Howe); Winchester (Atwater); Carlisle (Taylor); Amherst (Bromley).
Connecticut: Orange (Britton); New Haven (Walden).

Enallagma durum

Massachusetts: Nantucket (Bromley); Wianno (Howe).
Connecticut: Woodmont, Branford (Buttrick).

Enallagma cynathigerum

June 10 to July 18.

Maine: Bar Harbor (Johnson).

Vermont: South Hero (Cushman).

Massachusetts: Amherst (Bromley); Woods Hole (Gray).

Connecticut: New Haven (Walden).

Enallagma hageni

June 29 to August 10.

Maine: Belfast (Cushman); Monmouth (Frost).

New Hampshire: Sunapee (Johnstone).

Vermont: Coventry (Cushman).

Massachusetts: Danvers (Morse).

Enallagma calverti

Massachusetts: Framingham (Howe); Melrose (Anderson); Haverhill (Morse).

Enallagma ebrium

Maine: Ogunquit (Blair-Smith); Liberty (Cushman).

Vermont: Shoreham (Cushman).

Massachusetts: Salem (Walker); Amherst (Bromley); Winchester (Atwater); Lynn (Morse).

Connecticut: New Haven (Walden); West Thompson (Vierick).

Enallagma traviatum

Connecticut: Pistapaug pond, Wallingford (Garman).

Enallagma aspersum

July 9.

Massachusetts: Manomet (Cushman); Winchester (Atwater); Amherst (Bromley).

Connecticut: (C. A. E. S.).

Enallagma minusculum

Massachusetts: Winanno (Howe).

Enallagma doubledayi

June 28 to September 13.

Massachusetts: Hyannis, Chatham, Harwich (Howe); Woods Hole (Gray).

Enallagma carunculatum

Connecticut: (C. A. E. S.).

Enallagma civile

Salt marshes.

Massachusetts: Woods Hole, Tuckernuck island, West Tisbury (Cushman); Manomet (Johnson, Brooks); Wianno, Orleans, Brewster, Brookline (Howe); Woods Hole (Gray); Westfield, Amherst (Bromley); Rockport, West Peabody, Wenham (Morse); Horse Neck Beach (Holt); Tarpaulin Cove (Bryant).

Rhode Island: Block Island (Howe); Wickford (Atwater).

Connecticut: New Haven (Vierick); Whitneyville (Buttrick).

Enallagma geminatum

Massachusetts: West Peabody, West Andover (Morse).

Connecticut: Mt. Carmel (Moore); New Haven (Moore, Vierick).

Enallagma laterale

Rhode Island: Wickford (Johnson).

Enallagma exsulans

Massachusetts: Brewster (Howe).

Connecticut: Putnam (Vierick).

Enallagma signatum

Massachusetts: Woods Hole (Gray); South Chatham, Orleans (Howe);
Amherst (Bromley); Framingham (Warden); Peabody (Morse).
Connecticut: West Thompson (Vierick).

Enallagma pollutum should read **Enallagma vesperum**. See Calvert, Trans.
Amer. Ent. Soc. 45:381, 1919.

June 21.

Massachusetts: Manomet (Johnson); Cohasset (Bryant).
Connecticut: North Guilford, Litchfield, Mt. Carmel (Garman).

Nehalennia irene

June 20.

Maine: Belfast; Liberty (Cushman); Monmouth (Frost).
Massachusetts: Woods Hole (Cushman); Wenham (Morse); Amherst
(Bromley).
Rhode Island: Bristol, Wickford (Johnson).
Connecticut: West Haven (Vierick).

Amphiagrion saucium

May 25 to July 20.

Vermont: Coventry (Cushman).
Massachusetts: Amherst (Bromley); Peabody, Danvers (Morse).
Rhode Island: Wickford (Johnson).
Connecticut: New Haven (Britton, Vierick, Winkley).

Chromagrion conditum

New Hampshire: Jaffrey (Johnson).
Connecticut: (C. A. E. S.).

Ischnura verticalis

Salt marshes.

Maine: Liberty, Belfast (Cushman).
New Hampshire: Sunapee (Johnstone).
Vermont: Derby (Cushman); Bennington, Manchester (Johnson).
Massachusetts: Horse Neck Beach (Holt); Woods Hole, Nantucket,
Tuckernuck, Nomanset Island (Cushman); Wellfleet, Edgartown
(Johnson); Tarpaulin Cove (Bryant); Melrose (Anderson);
Brewster, Orleans, Ashburnham, South Chatham, Hyannis, Wianno,
Block Island, Harwich (Howe); Salem (Walker); Woods Hole
(Gray); Amherst (Bromley); Lynnfield, Rockport (Morse); Win-
chester (Atwater); Amherst, West Roxbury (Taylor).
Connecticut: Portland (Walden); West Thompson, Lake Whitney
(Vierick); Poquonock (Britton); Mt. Carmel (Moore); South
Manchester (Sturgis).

Ischnura posita

Massachusetts: Cohasset (Bryant); Tisbury (Cushman).
Rhode Island: Wickford (Johnson).
Connecticut: Winneepauk (Johnson).

Cordulegaster diastatops

Vermont: Bennington (Johnson).
Massachusetts: Amherst (Bromley).
a. Black of head *brown*, abdomen *spotted* with yellow.

Cordulegaster maculatus

Maine: Monmouth (Frost).
Massachusetts: Amherst (Bromley); Framingham (Warden).
Connecticut: Rainbow (Kirk).
"Pepperill (Hawker)" should read, Pepperill (Parker).

- Cordulegaster obliquus**
Connecticut: Westville (Walden).
Insert b. Back of head **black**, abdomen **banded** with yellow.
- Progomphus obscurus**
August 21.
Massachusetts: Brewster, South Chatham, Wianno (Howe).
- Hagenius brevistylus**
June 15.
Massachusetts: Essex Co. (Morse); Amherst (Bromley).
- Ophiogomphus mainensis**
Massachusetts: Dr. Muttkowski includes "Mass." in his list of
Odonata of North America—the record cannot be traced.
- Ophiogomphus johannus**
Connecticut: (C. A. E. S.).
- Ophiogomphus rupinsulensis**
June 14.
Massachusetts: Great Barrington (Johnson).
Connecticut: (C. A. E. S.).
- Ophiogomphus aspersus**
Massachusetts: Amherst (Bromley).
- Gomphus albistylus**
Connecticut: (C. A. E. S.).
- Gomphus parvulus**
Maine: Monmouth (Frost).
Massachusetts: Chester, Great Barrington (Johnson).
- Gomphus brevis**
Massachusetts: Mt. Tom (Needham); Amherst (Bromley).
Connecticut: (C. A. E. S.).
- Gomphus exilis**
New Hampshire: Squam lake (Allen); Fitzwilliam (Howe).
Massachusetts: Framingham (Warden, Frost); Manomet (Johnson);
Amherst (Bromley); Orleans, Chatham (Howe); West Peabody
(Morse); Medford (Anderson); Forest Hills (Brues); Winches-
ter (Atwater).
Connecticut: West Thompson (Vierick); New Haven, Westville, Mt.
Carmel (Walden).
- Gomphus lividus**
Massachusetts: Amherst (Bromley).
Connecticut: (C. A. E. S.).
- Gomphus ventricosus**
June 10.
Massachusetts: Amherst (Bromley).
- Gomphus adelphus**
Massachusetts: Cambridge? (Hagen).
- Gomphus borealis**
New Hampshire: Jaffrey (Johnson).
Connecticut: (C. A. E. S.).
- Gomphus spicatus.**
Maine: Bar Harbor (Johnson).
Vermont: Manchester (Johnson).
Massachusetts: Amherst (Bromley).
Rhode Island: Washington (Johnson).
Connecticut: (C. A. E. S.).

Gomphus furcifer.

Massachusetts: Essex Co. (Morse).

Gomphus scudderi

Maine: Orono (Harvey).

Dromogomphus spinosus

June 12.

New Hampshire: Fitzwilliam (Howe).

Massachusetts: Chatham (Howe); Amherst (Bromley).

Connecticut: (C. A. E. S.).

Boyeria vinosa

September 26.

Massachusetts: Petersham (Wheeler); Framingham (Warden); Brookline (Shurtleff); West Townsend (Howe); Amherst (Bromley).

Boyeria grafiana

August 7, 1920.

New Hampshire: Sunapee (Johnstone).

Basiaeschna janata

August 13.

Massachusetts: Amherst (Bromley); Framingham (Howe); Carver (B. S. N. H.).

Connecticut: (C. A. E. S.).

Gomphaeschna fuscillata

July 28.

Massachusetts: Salem (Walker); West Peabody (Morse).

Connecticut: Westville (Britton); Lyme (Zappe); New Haven (Lowry); North Branford (Walden).

Anax junius

Maine: Ogunquit (Blair-Smith).

Massachusetts: Amherst (Bromley); Winchester (Atwater); Woods Hole (Gray); Winchendon (Johnson); Peabody (Morse); Hyannis (Howe).

Rhode Island: Block Island (Howe).

Connecticut: New Haven (Britton); Whitneyville (Buttrick); Milford (Vierick).

Anax longipes

Note: Hagen's record (Ent. Mo. Mag. 20:169-170, 1884) was of two males and one female that were taken flying about the "tops of trees on [a] hill."

Aeshna umbrosa

November 1.

Maine: Bar Harbor, North-east Harbor (Johnson); Bethel (Lamb).

New Hampshire: Sunapee (Johnstone); Meredith (Wheeler); Jaffrey, Fitzwilliam (Howe).

Massachusetts: Princeton (Johnson); Heath (Warden); Amherst (Bromley); Blue Hill (Taylor); Watertown, Arlington (Anderson); Ashby, Ashburnham (Howe); Westboro (Pay); Wenham (Morse).

Connecticut: (C. A. E. S.).

Aeshna interrupta

September 18.

Massachusetts: Wenham (Morse).

Aeshna clepsydra

Maine: Bar Harbor (Johnson); Liberty (Cushman).
Massachusetts: Amherst (Bromley); Wianno, Hyannis, Brewster
(Howe); Brookline (Shurtleff).
Connecticut: (C. A. E. S.).

Aeshna mutata

June 5, 1902

Aeshna verticalis

July 17.
New Hampshire: Sunapee (Johnstone).
Massachusetts: Forest Hills (Wheeler); Arlington (Anderson); Salem
(Morse); Amherst (Bromley); Chatham (Howe).
Connecticut: Salisbury, New Haven (Britton); Scotland (Walden).

Aeshna tuberculifera

August 1 to September 23
Massachusetts: South Orleans, Hyannis, Chatham (Howe); Wrentham
(Frost); Heath (Warden).
Connecticut: (C. A. E. S.).

Aeshna canadensis

Maine: Bar Harbor (Johnson).
New Hampshire: Sunapee (Johnstone); Fitzwilliam (Gallagher).
Massachusetts: South Orleans, Ashburnham (Howe); Petersham
(Wheeler); Heath (Warden); Amherst (Bromley).
Connecticut: (C. A. E. S.).

Aeshna constricta

Massachusetts: Amherst (Bromley); Essex Co. (Morse).

Nasiaeschna pentacantha

June 14.
Massachusetts: Wellesley (Needham); Concord (Howe); Dedham
(Clark); (see Psyche 27:154, 155, 1920).

Epiaeschna heros

September 17.
New Hampshire: Mt. Monadnock (Johnson).
Massachusetts: Woods Hole (Gray); Marblehead, Swampscott
(Walker); Salem, Marblehead (Morse); Amherst (Bromley).
Connecticut: Lyme (Zappe); New Haven (Lowry); North Branford
(Walden).

Didymops transversa

Maine: Capens (Johnson); Monmouth (Frost).
New Hampshire: Squam lake (Allen); Jaffrey (Johnson).
Massachusetts: Rutland (Johnson); Melrose (Anderson); Framing-
ham (Howe); Amherst (Bromley); Salem (Morse).
Connecticut: Mt. Carmel (Walden).

Macromia illinoiensis

June 16.
New Hampshire: Fitzwilliam (Fenn).
Massachusetts: Amherst (Bromley); Wianno (Howe).

Williamsonia lintneri

Massachusetts: Framingham (Frost); Middleton (Walker); Hopkin-
ton (Frost).

Dorocordulia lepida

Massachusetts: Sharon (Johnson); West Peabody (Morse).
Rhode Island: Washington (Johnson).
Connecticut: (C. A. E. S.).

Dorocordulia libera

New Hampshire: Mt. Monadnock (Johnson).

Massachusetts: Amherst (Bromley).

Connecticut: (C. A. E. S.).

Epicordulia princeps

Massachusetts: Brewster, Wianno, Hyannis (Howe); Woods Hole (Gray).

Connecticut: (C. A. E. S.).

Helocordulia uhleri

Massachusetts: Amherst (Bromley).

Connecticut: (C. A. E. S.).

Somatochlora cingulata

Massachusetts: Dr. Muttkowski includes Massachusetts in his Odonata of North America, but the record seems untraceable.

Somatochlora elongata

August 21.

New Hampshire: Sunapee (Johnstone).

Somatochlora linearis

July 2.

Connecticut: Orange (Zappe).

Somatochlora williamsoni

August 8.

New Hampshire: Sunapee (Johnstone).

Somatochlora kennedyi

Massachusetts: Middleton (Walker).

Somatochlora minor

Connecticut: (C. A. E. S.).

Somatochlora tenebrosa

Connecticut: (C. A. E. S.).

Cordulia shurtleffi

New Hampshire: Jaffrey (Johnson).

Connecticut: (C. A. E. S.).

Tetragoneuria cynosura

July 12

Massachusetts: Framingham (Warden); Chatham, Boston (Howe); Amherst (Bromley); Cambridge (Lamb); Arlington (Anderson); Woods Hole (Gray).

Connecticut: West Thompson (Vierek); Mt. Carmel, New Haven (Walden).

Tetragoneuria c. simulans

Maine: Monmouth (Frost); South-west Harbor (Johnson).

New Hampshire: Squam lake (Allen).

Vermont: Bennington (Johnson).

Massachusetts: Woods Hole (Gray); Framingham (Howe); Melrose (Anderson); Danvers (Morse).

Connecticut: (C. A. E. S.).

under A.

c. Brown of hindwings reaching to *nodus*.

Tetragoneuria spinigera

New Hampshire: Fitzwilliam (Howe); Jaffrey (Johnson).

Vermont: Manchester (Johnson).

Massachusetts: Littleton (Howe); Winchester (Atwater).

Connecticut: Goshen (Zappe).

Tetragoneuria canis

May 31.

Maine: Manchester (Wadsworth); Dr. Muttkowski gives this record
ibid. 132.

Massachusetts: Concord (Howe). (Psyche 27:155, 1920.)

Connecticut: (C. A. E. S.).

Libellula auripennis

September 13.

Massachusetts: Harwich, Hyannis, Chatham (Howe); Woods Hole
(Gray).

Connecticut: (C. A. E. S.).

Libellula incesta

Massachusetts: Amherst (Bromley); Harwich, Wianno, South Chatham (Howe); Woods Hole (Gray); West Peabody (Morse).

Libellula vibrans

July 7.

Maine: Dr. Muttkowski includes this species from Maine (ibid. 141),
but the record is untraceable and very doubtful.

Massachusetts: Woods Hole (Gray).

Connecticut: East Haven (Walden).

Libellula flavida

The Concord record must be expunged, as the specimen determined
by Mr. Williamson has since been pronounced by Dr. Calvert as
L. cyanea, though showing some misleading characters. The
Wareham record is therefore also referable to *L. cyanea*. As the
author had not listed definitely *L. flavida* as a New England species,
because certain discrepancies were evident if the Concord
species were true *L. flavida*—he wishes now to withdraw the last
sentence in the Note on page 70. *L. flavida*, Ramb., is apparently
sufficiently distinct to be recognized.

Libellula cyanea

Massachusetts: Amherst (Bromley); Harwich (Howe); Woods Hole
Gray); Danvers (Morse).

Connecticut: New Haven (Moore).

Libellula exusta

New Hampshire: Squam lake (Allen).

Massachusetts: Framingham (Frost); Winchendon (Johnson); Woods
Hole (Gray); Amherst (Bromley); Chatham (Howe); West Pea-
body (Morse).

Libellula luctuosa

June 3.

Massachusetts: Amherst (Bromley); Danvers, Lynn, West Peabody,
Boxford (Morse).

Rhode Island: Block Island (Howe).

Connecticut: New Haven (Vierick); Southington (Walden).

Libellula quadrimaculata

Maine: South-west Harbor (Johnson).

New Hampshire: Hanover (Britton).

Massachusetts: Amherst (Bromley); Swampscott (Walker); Woods
Hole (Gray); Plum Island (Morse).

Libellula semifasciata

Massachusetts: Amherst (Bromley); Woods Hole (Gray); Salem,
West Peabody (Morse).

Connecticut: New Haven (Walden).

Libellula pulchella

Maine: Ogunquit (Blair-Smith).

Massachusetts: Harwich, Wianno, South Chatham, Hyannis (Howe);
Winchester (Atwater); Amherst (Bromley); Salem (Walker);
Forest Hills (Henshaw, Wheeler); Beverly (B. S. N. H.); Med-
ford, Watertown (Anderson); Woods Hole (Gray); West Pea-
body, Danvers (Morse).

Rhode Island: Block Island (Howe).

Connecticut: Durham (Zappe); West Haven (Britton); Branford
(Vierick); New Haven (Walden); Whitneyville (Buttrick).

Plathemis lydia

May 10 to September 23.

Maine: Bar Harbor (Johnson).

Massachusetts: Andover (B. S. N. H.); Cambridge, Waltham (Howe);
Woods Hole (Gray); Winchester (Atwater); Amherst (Bromley);
Forest Hills (Brues); Great Barrington (Johnson); Lynnfield,
West Peabody, Wenham, Salem, Danvers (Morse).

Connecticut: Branford (Winkley); East Haven (Walden).

Perithemis domitia tenera

June 8.

Massachusetts: Winchester (Atwater); South Chatham (Howe); East
Wareham, Amherst (Bromley); Woods Hole (Gray); West Pea-
body (Morse); Amherst (Taylor); Auburndale (Johnson).

Rhode Island: Block Island (Howe).

Connecticut: West Thompson (Vierick); New Haven (Britton);
Whitneyville (Buttrick).

Nannothemis bella

June 7.

Massachusetts: South Chatham (Howe); Amherst (Bromley).

Rhode Island: Wickford (Johnson).

Connecticut: New Haven (Walden).

Erythrodiplax berenice

August 28

Massachusetts: Cambridge (Bromley); Woods Hole (Cushman, Gray);
Boston, Revere (B. S. N. H.); Plum Island (Morse).

Connecticut: Stratford (Britton); Stonington (Hyslop); Short Beach
(Buttrick).

Erythemis simplicicollis

September 13.

Massachusetts: Harwich, Wianno, Hyannis, South Chatham, Chatham
(Howe); Amherst (Bromley); Woods Hole (Gray); Boston (B. S.
N. H.); West Peabody (Morse).

Rhode Island: Block Island (Howe).

Connecticut: East Haven (Buttrick).

Pachydiplax longipennis

Massachusetts: Woods Hole (Gray); Chatham, Harwich, Brewster
(Howe); West Peabody (Morse).

Rhode Island: Block Island (Howe).

Connecticut: New Haven (Walden).

Sympetrum rubicundulum

Maine: Roque Bluffs, South West Harbor, Ashland Junction, Mt.
Desert (Johnson); Chamberlain Lake (Cushman); Ogunquit
(Blair-Smith).

New Hampshire: Fitzwilliam (Howe); Sunapee (Johnstone); Monad-
nock, Glen House (Johnson).

Massachusetts: Woods Hole (Gray); Danvers, West Peabody, Salem (Morse); Harwich, Waltham, Brookline, Brewster, Wianno, South Chatham, Hyannis (Howe); Petersham, Blue Hill, Stony Brook, Forest Hills (Wheeler); Salem (Walker); Woods Hole (Cushman); Weston (Paine); Winchester (Atwater); Amherst (Bromley); Weston, Sunderland, West Roxbury, Carlisle (Taylor); Martha's Vineyard, Brookline, Wellfleet, Auburndale (Johnson).

Rhode Island: Block Island (Howe).

Connecticut: South Manchester (Sturgis); Westville, Buttrick (Britton); New Haven (Zappe, Moore, Walden, Vierick); Branford, Westbrook (Vierick); Short Beach (Buttrick); Stonington (Hyslop).

*Sides of thorax *unmarked*.

**Sides of thorax with *two yellow dots*.

Put after "1. Wings over 25 mm. long."

Sympetrum obtrusum

Maine: Fryeburg (Harvey) record expunged by Williamson.

Massachusetts: Blue Hills (Wheeler); Woods Hole (Gray).

Sympetrum semicinctum

June 29.

Massachusetts: Heath (Warden); Winchester (Atwater); Amherst (Bromley); Plum Island (Morse).

Connecticut: Chapinville (Britton).

after "b. Wings with **front margin yellow**, 27 mm. long." read

*Legs marked with *yellow*.

**Legs entirely *black*.

Sympetrum costiferum

Massachusetts: Harwich, Wianno, Chatham (Howe); Manomet (Brooks); Nantucket (**Cushman**).

Connecticut: (C. A. E. S.).

Sympetrum vicinum

Maine: Bar Harbor (Johnson).

New Hampshire: Mt. Monadnock (Johnson); Fitzwilliam, Rindge, Jaffrey (Howe); Meredith (Wheeler).

Massachusetts: West Roxbury, Cambridge, Boston (B. S. N. H.); Danvers (Morse); Salem (Walker); Tisbury (Cushman); Manomet (Brooks); Petersham, Stony Brook, Blue Hills (Wheeler); Petersham (Taylor); Cambridge, Ashburnham, Brewster, South Chatham, Chatham (Howe); Heath (Warden); Winchester (Atwater); Amherst (Bromley).

Connecticut: Stonington (Hyslop); New Haven (Vierick).

Leucorrhinia intacta

Maine: Monmouth, Wales (Frost).

New Hampshire: Sunapee (Johnstone); Jaffrey (Johnsen).

Massachusetts: Woods Hole (Gray); Amherst (Bromley); Boston (Henshaw); Blue Hills (B. S. N. H.); Salem (Walker); Danvers, Lynn (Morse); Medford (Anderson); Great Barrington (Johnson).

Rhode Island: Bristol, Washington (Johnson).

Connecticut: Lyme, Mt. Carmel (Walden); New Haven, Lake Whitney (Vierick).

Leucorrhinia gracilis

Connecticut: (C. A. E. S.).

Leucorrhinia frigida

August 18.

Massachusetts: Woods Hole (Gray); Wenham (Morse); Petersham (Wheeler).

Connecticut: (C. A. E. S.).

Celithemis elisa

August 23.

Maine: Bar Harbor (Johnson). *

Massachusetts: Plum Island (Morse); Wianno, Chatham, South Chatham, Hyannis, Harwich (Howe); Woods Hole (Gray); Winchester (Atwater); Bedford (Swett).

Connecticut: Yalesville (Walden); New Haven (Britton).

Celithemis eponina

Massachusetts: Boxford, West Peabody (Morse); East Wareham, Southwick (Bromley).

Rhode Island: Block Island (Howe).

Connecticut: South Manchester (Sturgis); New Haven (Walden); Whitneyville (Buttrick).

Celithemis monomelaena

August 20.

Massachusetts: Wianno (Howe).

Celithemis ornata

August 21.

Massachusetts: Hyannis, Harwich, South Chatham, Brewster (Howe); Blue Hill Reservation (Wheeler).

Tramea carolina

May 28.

Massachusetts: Amherst (Bromley); Harwich, Block Island (Howe); Woods Hole (Gray).

Connecticut: Branford (Walden).

Tramea lacerata

Massachusetts: Plum Island, September 10, 1911 (Morse).

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In this latter work, the Connecticut record for *Aeschna juncea*, page 35, and for *Somatochlora elongata* var. *minor*, page 36, have proved to be errors, and should be expunged.

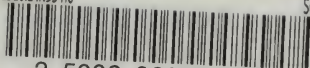
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